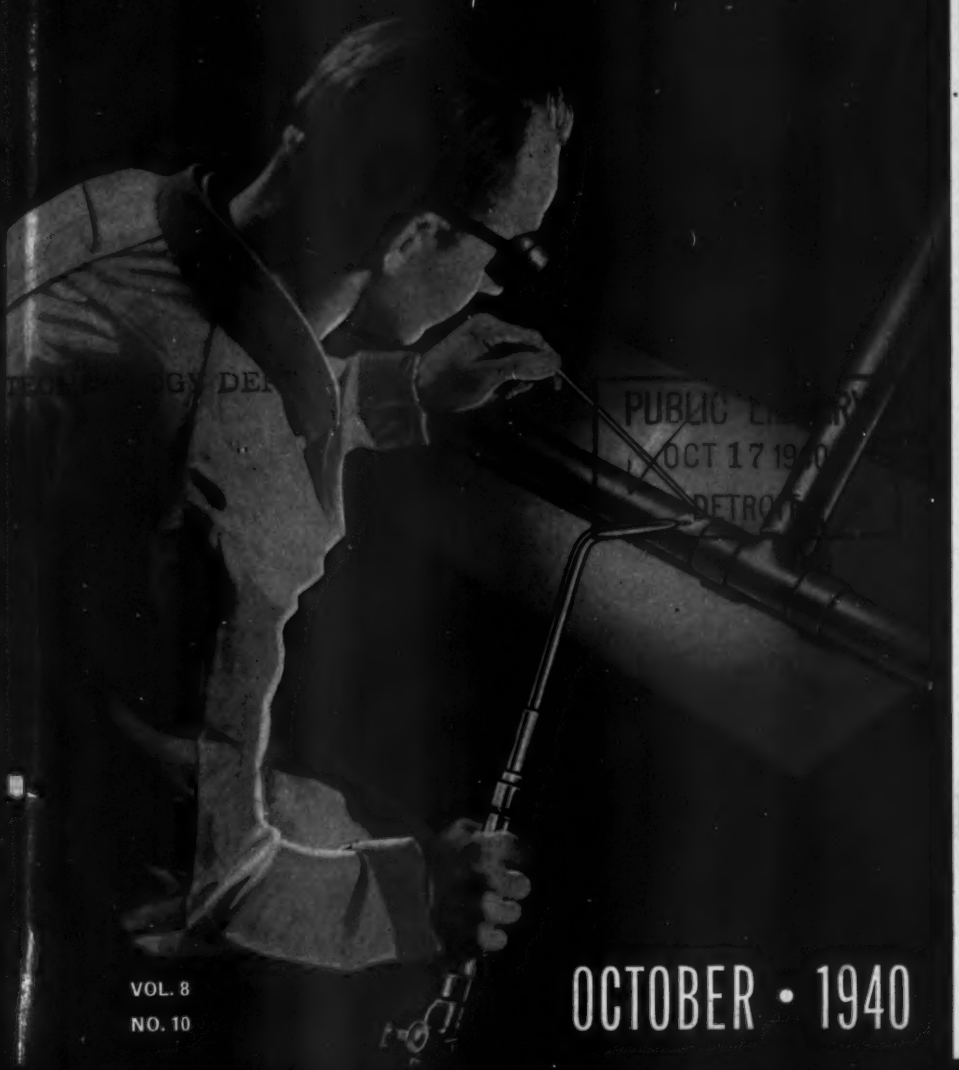
The Refrigeration Service Engineer



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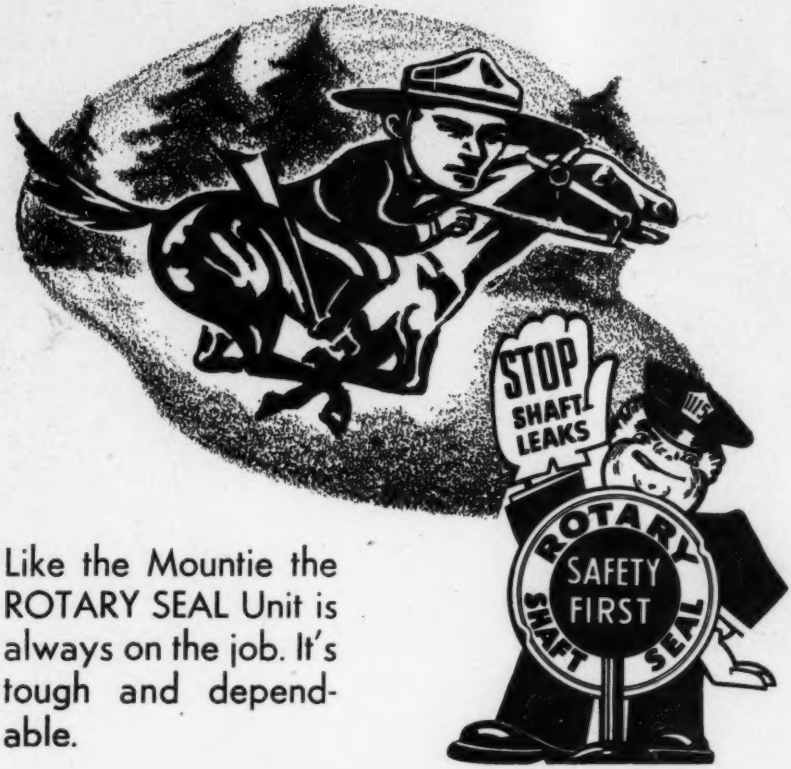

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The Refrigeration Service Engineer

Vol. 8 No. 10

October, 1940

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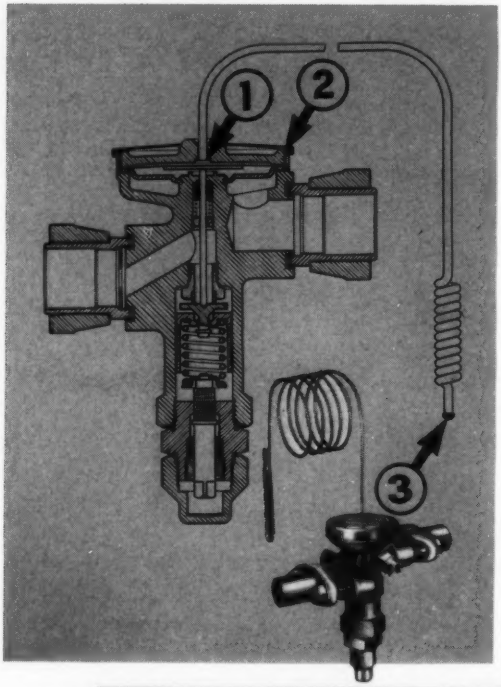
GOOD THERMAL ELEMENTS need not be replaced

DURA-FRAM POWER ELEMENTS HAVE ONLY 3 JOINTS



AN Expansion valve power element when made of the best materials and under close process control should function as long as the rest of the system. It should not have to be replaced.

When the power element is a permanent part of the valve, as it is with Detroit Dura-Fram Expansion Valves, the danger of power element leakage is practically eliminated because of the fewer number of joints and because of the way the joints are made permanently tight. For instance, the Dura-Fram power element itself has *just three joints.*

Furthermore, every Dura-Fram power element joint is silver brazed. No soft solder is used anywhere in its construction —nor any gaskets in its assembly. Dura-Fram power elements are permanently assembled with the valve.

Superior power element design assures greater dependability in the valve but this is only one of the many advantages Dura-Fram valves offer. Write for Bulletin No. 190 for the full story on these units.

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The Refrigeration Service Engineer

Vol. 8, No. 10 CHICAGO, OCTOBER, 1940 $2.00 per Annum

Estimating and Selling Commercial Refrigeration

By S. C. MONCHER*

Those of us engaged in the commercial refrigeration industry are often called upon to submit estimates on jobs, of which perhaps only one out of ten will result in contracts. Wherefore, it would not be economically feasible to engineer each installation individually, a quick method of estimation being necessary.

It is with this in mind that a series of about seven articles has been written the first of which follows. By the simple expedient of multiplying the exposed square feet of refrigerator surface by the temperature difference between inside and outside by an overall factor, the estimated 24 hour load is obtainable directly. Results thus calculated will be found fairly accurate within temperature differentials ordinarily encountered. Of course, before an installation is actually made, it should be completely engineered by approved methods.—Author.

Grocery or Delicatessen Store

THE refrigeration requirements of the up-to-date grocer or delicatessen storekeeper are indeed varied and diversified. Of the large variety of products commonly carried in establishments of this type, the following require refrigeration in order to remain salable for any length of time:

(1) Dairy products, such as milk, cream, butter, cheese, eggs.
(2) Prepared meats, such as smoked hams, bolognas, corned beef.
(3) Salads, such as coleslaw, potato salad, pickles, olives.
(4) Bottled beer, soft drinks, fruit juices, and the like.

Due to the nature of his business, the grocer or delicatessen storekeeper must have quick access to all his goods. In addition, it is to his advantage to display his wares attractively. These are the two points upon which the commercial refrigeration sales presentation must be based. From a technical point of view, the products carried in an establishment of the type we are discussing present no difficult refrigeration problem, and most grocers and delicatessen men are satisfied with the performance of their old ice refrigerator. They are anxious to see, however, how they can increase their sales, and at the same time save steps in waiting on their customers. With the mod-

*Author of Commercial Refrigeration and Comfort Cooling.

Here is a typical modern delicatessen and grocery store equipped with modern refrigeration and all metal fixtures. All the equipment including the shelves and scales in this store were sold by McCarty Bros. Western Refrigeration Co., in River Forest, Ill.

ern counter display case and wall type dairy refrigerator we can do just that. Every modern grocery or delicatessen shop should have one or both of these refrigerators, for the increase in sales and saving in labor costs soon repay the storekeeper the amount of money invested in the equipment.

In addition, the commercial refrigeration salesman should point out the advantages which modern mechanical refrigeration provides in the way of lower refrigerator temperatures and higher humidities. The old ice refrigerators can rarely do better than maintain a temperature of 50 degrees during the summer months. The present day display case and dairy refrigerator are designed to maintain temperatures of 40-45 degrees with high relative humidities, under which conditions food products remain in excellent condition without drying out for much longer periods of time.

Often, the storekeeper is unable to go to the expense of installing new refrigerators, but can be interested in equipping his present refrigerators with modern mechanical equipment. If he has been using ice, the saving in the cost of ice will pay for the new system if amortized over a period of three years or less. In addition, he will be relieved of the bother entailed in keeping the ice bunkers replenished. If on the other hand, the storekeeper is struggling along with a mechanical system of old vintage, the sav-

TABLE 1. OVERALL HEAT GAIN OF A DAIRY REFRIGERATOR, EXPRESSED IN B.T.U. PER SQUARE FOOT OF OUTSIDE SURFACE PER DEGREE TEMPERATURE DIFFERENCE PER 24 HOURS.

INSULATION (INCHES OF CORK OR EQUIVALENT)	UP TO 250 SQUARE FEET		OVER 250 SQUARE FEET	
	DOUBLE GLASS	SINGLE GLASS	DOUBLE GLASS	SINGLE GLASS
2	5.7	5.9	5.5	5.7
3	5.0	5.2	4.8	5.0
4	4.7	4.9	4.5	4.7

TABLE 2. OVERALL HEAT GAIN OF A DELICATESSEN DISPLAY CASE (DOUBLE-DUTY, WITH BOTTOM STORAGE COMPARTMENT), EXPRESSED IN B.T.U. PER LINEAL FOOT PER DEGREE PER 24 HOURS.

	UP TO 10' LONG	OVER 10' LONG
Double glass	81	77
Triple glass	68	64

TABLE 3. OVERALL HEAT GAIN OF A DELICATESSEN WALK-IN REFRIGERATOR, EXPRESSED IN B.T.U. PER SQUARE FOOT PER DEGREE PER 24 HOURS.

INSULATION INCHES	UP TO 350 SQ. FT.	OVER 350 SQ. FT.
2	4.6	4.4
3	3.9	3.7
4	3.6	3.4

ings in lower power costs and decreased shrinkage will again soon pay for the replacement.

We shall consider a replacement installation, where both a display case and a dairy refrigerator are contained in the same store. The survey sheet is given below.

SURVEY SHEET FOR DELICATESSEN

	DISPLAY CASE	DAIRY REFRIGERATOR
Size overall	10′ long	8′x3′x8′ high
Insulation	3″ cork	3″ cork
Glass	double	double
Maximum store temperature	90°	90°
Refrigerator temperature	40°	40°

Load Calculations

Dairy Refrigerator. The outside square feet of surface are calculated by adding together the exposed square feet of surface of each individual wall. A short cut is to take the area of the floor and two adjacent walls and multiply each by two as follows:

8×3×2= 48
8×8×2=128
8×3×2= 48

Total.....224 square feet

From Table 1, the overall heat load factor under our given conditions is 5.0 B.t.u. per 24 hrs. per sq. ft.

The temperature difference is 90—40=50 degrees.

Total load=224×5×50=56000 B.t.u. per 24 hrs.

TABLE 4. OVERALL HEAT GAIN OF A WALK-IN, REACH-IN COMBINATION DAIRY DELICATESSEN REFRIGERATOR, EXPRESSED IN B.T.U. PER SQUARE FOOT PER DEGREE PER 24 HOURS.

INSULATION INCHES	UP TO 350 SQ. FT.	OVER 350 SQ. FT.
2	5.2	5.0
3	4.5	4.3
4	4.2	4.1

Display Case. From Table 2, we find that a display case of our particular description has an overall heat load factor of 81 B.t.u. per 24 hours per lineal foot. Therefore,

Total heat=81×10×50=40500 B.t.u. per 24 hrs.

The total load imposed on the condensing unit by the two fixtures will be 56000+40500=96500 B.t.u. per 24 hrs.

(To be Continued)

In the next article the Author will discuss Meat Markets.

UNIVERSITY OFFERS EXTENSION COURSES

AN outstanding series of University extension courses under auspices of the Massachusetts Department of Education, is announced for this Fall. Included are courses in refrigeration and air conditioning.

Leo F. Carton, installation and service supervisor, General Motors Corp., will conduct a series of 24 lectures, beginning November 1 on household and commercial refrigeration, the course to be in three parts. Part 1 will be devoted to household refrigerators, Part 2 entirely to the usual types of commercial refrigerators, and Part 3 to the proper selection of equipment.

Air conditioning for factories and other large buildings will be treated by C. Wesley Nelson, instructor in mechanical engineering at Wentworth Institute, for a course of 15 lectures, starting October 29. This evening course is also offered by correspondence.

C. P. Yaglou, associate professor of industrial hygiene, Harvard School of Public Health, will, beginning October 17, give a series of 16 lectures on the "Thermodynamics of Air Conditioning."

Automatic controls for cooling, heating and air conditioning are the subject of a series of eight lessons to be given by John H. Barrett, sales engineer, Minneapolis-Honeywell Regulator Co.

Instrument craftsmanship will be treated in 16 lessons by Alfred Herschel, research engineer and supervisor of training, the Foxboro Co., beginning October 22, covering the fundamentals of the various industrial instruments in common use. Another course by Mr. Herschel, beginning October 24, is intended for those who have knowledge of the subject equivalent to the first named course. This covers eight lectures.

P. A. L. Foulds, consulting engineer, will conduct another course in practical air conditioning for residences, restaurants, stores and offices, beginning October 24.

Third Article

Thermostatically Controlled Expansion Valves

By A. F. HOESEL*

I PREVIOUSLY mentioned that the orifice sizing of thermal valves could have a great influence upon the operating characteristics of such valves.

To some extent, this is generally known by most service men and this knowledge has come about mostly by the manufacturers' rating of the different sizes of orifices employed in their valves.

To most service men the actual principles involved in proper orifice sizing of thermal valves is somewhat of a mystery; therefore, the following explanations should be beneficial to a clear understanding of the same.

Experiments have definitely proven that it is possible to take a standard automatic expansion valve of practically unlimited capacity, having tight valve seats, and with it maintain some definite back pressure even on a very small capacity system. Note that I say automatic expansion valve, which is nothing more nor less than a pressure reducing valve, and not a thermal expansion valve.

The only difference between an automatic expansion valve and a thermal expansion valve is that the latter is an automatic expansion valve modified by the addition of a thermostatic power element in place of the usual spring pressure imposed on the top of the diaphragm of the automatic expansion valve.

In view of the above, it is evident that the necessity of proper orifice sizing of thermal expansion valves must in some manner be related to the functioning of the power element and its thermostatic charge.

An automatic expansion valve is governed in its operation by two forces which act practically instantaneously. One force is that of atmospheric pressure plus spring pressure on the top of the diaphragm and tending to open the valve. The other force is that of the pressure of the expanded refrigerant plus any spring pressure necessary to close the valve proper. It is well to keep in mind that these forces act practically instantaneously as mentioned before.

Now, when we add a power element to the automatic expansion valve and convert it into a thermal expansion valve, we are adding a system which has an inherent time lag element in its operation.

The Three Elements

In a thermal expansion valve we have three elements comprising the closed thermostatic system: One element is the flexible wall, either a bellows or a diaphragm, which operates the valve proper, and which with its attendant cover provides a certain volumetric space; the other element is the temperature-feeler bulb, clamped to the suction line, and also having a certain volumetric space; the third element is a capillary tube joining the two volumetric spaces so that pressures may be transmitted from one to the other as occasion demands.

This closed thermostatic system is charged with a volatile fluid, usually the same as the refrigerant to be controlled by the valve.

The controlling element is the temperature-feeler bulb, which during normal operation contains some thermostatic charge in liquid phase. As the refrigerant demand increases and decreases, due, in part, to increase and decrease of the temperature of the temperature-feeler bulb, there is a transfer of vapor respectively from and to the temperature-feeler bulb volumetric space by means of the capillary tube.

We are all acquainted with the fact that you cannot place a thermometer in a space and immediately read the space temperature. It takes some time before the thermometer reaches the space temperature. This is what is termed "time lag." The temperature-feeler bulb of a thermal expansion valve

* Flow Controls, Inc., Chicago.

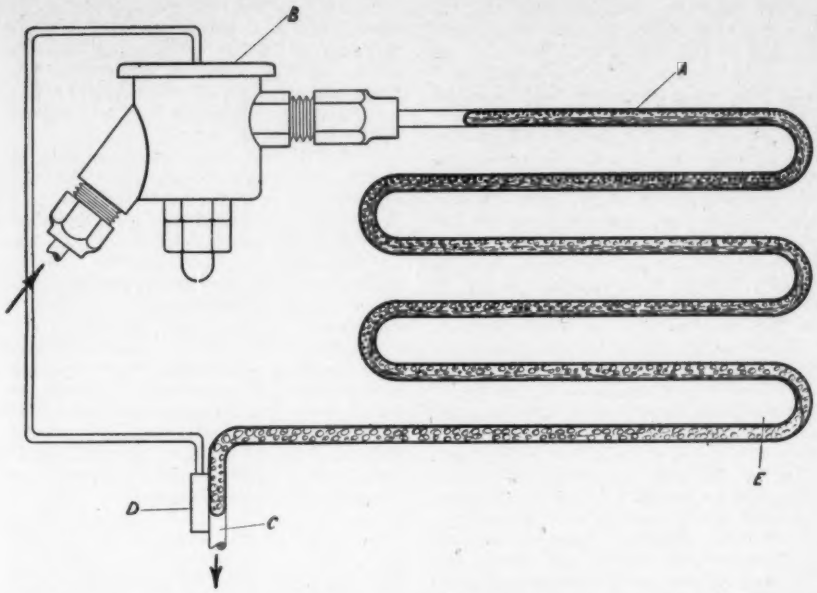

Fig. 5. In which A is the evaporator, B the thermal expansion valve, C the suction line, E the point where unvaporized liquid will reach and D is the feeler bulb.

also has a time lag factor. It does not immediately arrive at the temperature of the suction line, whenever refrigerant vapor temperature variations occur in the suction line.

Let us take an extreme example of a thermal expansion valve having a greatly oversized flow orifice and see just exactly what occurs. The temperature-feeler bulb is comparatively warm and the valve wide open. The refrigerant liquid floods through the cooling unit and passes into the suction line, which rapidly cools down. The temperature-feeler bulb also cools down, but not as fast as the suction line does; consequently the valve floods through to the compressor until such time as the temperature-feeler bulb cools down in turn.

Since the thermal expansion valve has been adjusted to carry, say, a 10 degrees F. superheat, the temperature-feeler bulb finally reaches a temperature at which the thermal valve starts to throttle. Even at this point sufficient refrigerant is still being fed to, or contained within, the cooling unit, so that the temperature-feeler bulb is cooled below its 10 degrees F. superheat temperature. Finally the thermal expansion valve stops feeding entirely since the temperature-feeler bulb has by now acquired a temperature practically equivalent to that of the refrigerant liquid in the cooling unit.

As the compressor continues to evacuate vapor from the cooling unit, without the thermal valve feeding refrigerant liquid thereto, there finally arrives a time when the suction line starts to, comparatively speaking, warm up. Because of the temperature time lag between the suction line and the temperature-feeler bulb clamped thereto, we find that the suction vapor is much over the 10 degrees F. superheat before the thermal valve again starts feeding refrigerant liquid to the cooling unit. This time lag between the temperature of the refrigerant vapor passing through the suction line and the temperature of the thermostatic charge of the thermal expansion valve, or more properly speaking, the temperature of the temperature-feeler bulb, will, in this instance of too large a refrigerant flow orifice, result in a hunting action. To put it more plainly, the thermal expansion valve will alternately overfeed and underfeed.

Now let us take the same valve, as above, except with a refrigerant flow orifice only

slightly larger in flow capacity than the refrigerant vaporizing capacity of the cooling unit to which it is connected. Assume the system starting up and the thermal valve being wide open. Since the valve flow capacity is rather close to the cooling unit vaporizing capacity, we find that the temperature of the suction line does not drop very suddenly; therefore, the temperature of the temperature-feeler bulb really starts to drop before liquid refrigerant can get to the suction line. In consequence, the thermal valve starts throttling, which further reduces the speed of the liquid refrigerant toward the suction line, and finally the thermal valve controls the feed, at its proper amount, without any flood back having occurred. If the demand for refrigeration increases, the thermal valve will then open farther, but it will not flood through since the maximum flow can never be considerably greater than the vaporizing capacity of the cooling unit.

In Fig. 5, I show a cooling unit "A" fed with refrigerant liquid by means of a conventional thermal expansion valve "B" responsive to superheat conditions of the refrigerant vapor leaving the suction line "C" and affecting the temperature-feeler bulb "D" clamped to the suction line "C."

For Example

We shall assume that during normal operation, with partial throttling of the thermal valve "B," the unvaporized liquid refrigerant reaches up to the point "E" and that the heat of superheat is added to the flowing vapor, due to heat input between "E" and the location of the temperature-feeler bulb "D." Theoretically, the portion of the cooling unit "A" between the thermal valve "B" and point "E" is at an equal temperature, and the portion between "E" and "C" is at an increasing temperature towards "C." Practically, this is not always true, but we must make certain assumptions in order to make a clear picture, without too many qualifications which may only lead to confusion.

Whether or not, all other things being equal, the thermal valve "B" will definitely control the flow of liquid refrigerant without momentary flood-back upon increase of heat load on the cooling unit "A," depends entirely upon two things. The first is the time speed of the liquid refrigerant flow from "E" towards "C," and the second is the temperature time lag between the temperature-feeler bulb "D" and the suction line "C."

Obviously, if the thermal valve "B" opens farther and the liquid refrigerant line then travels from "E" to "C" in, say, three seconds, and if it takes 15 seconds for the temperature-feeler bulb "D" to arrive at the then lower temperature of "C," there will be a momentary flood-back.

If the thermal valve "B" is so orificed that the increased refrigerant flow will take, say, 10 seconds to reach from "E" to "C," it certainly is obvious that during that time interim the temperature-feeler bulb "D" has reduced somewhat in temperature and the thermal valve "B" has already started throttling, thereby eliminating the momentary flood-back.

In view of the above, it can be readily understood as to how and why a too large orificed size thermal valve is conducive to hunting, whereby the cooling unit is alternately overfed and underfed, resulting in reduced heat absorption capacity, flood-back to compressor, etc., etc.

(To be continued)

FRIGIDAIRE TO MANUFACTURE ARMS

THE placing of a $20,000,000 machine gun order with Frigidaire Division, General Motors Corporation, announcement of which was made last week, will not interfere with manufacture of the company's regular products, according to a statement issued by E. G. Biechler, general manager.

"Manufacture of household electric refrigerators and ranges, and commercial refrigeration and air conditioning equipment, will continue unimpeded by the additional activity required in the production of machine guns in our plant," Mr. Biechler declared. "The task of providing machine guns for the government will be carried out with the use of additional facilities including a new five-story factory building. The regular line of products, therefore, will be manufactured on an uninterrupted schedule in the plants and with the machines ordinarily used for this purpose."

Henry A. Meyer
Texas

Truthfully I am ashamed of myself for putting this matter off this long, as I feel that THE REFRIGERATION SERVICE ENGINEER is my most valuable magazine. I don't intend to be without it.

Liquid Carbonic DX and Simplex 1940 Soda Fountains

By JOHN G. PRAETZ*

THE "Liquid" DX soda fountain refrigeration system consists of three direct expansion tube type evaporators, one in the syrup rail, one in the water cooling section and one in the ice cream section. The Liquid Simplex refrigeration system uses direct expansion refrigerated plates for the ice cream section evaporator, with direct expansion evaporators in the syrup rail and water cooling sections made from copper tubing.

Three refrigerant valves are required to control the refrigerant flow and water bath ice formation of both fountains, a TEV-F207 (Automatic Products No. F207, orifice 0.045 inch), and a TRV-20 (Frigidaire) on the syrup rail-water cooling section evaporators, and a second TEV-F207 (orifice 0.045) on the ice cream section. A Frigidaire No. 1122047 thermostatic switch is supplied with the fountain, the switch control bulb to be placed in a well indicated in Fig. 1 and 2. This switch will be sufficient to properly control the ice cream and water cooling sections, due to the ice reserve and hold over in the water cooling section and syrup rail ice formation without the necessity of a low pressure switch. All fountains are equipped with Freon valves as standard.

Ice Cream Section

The ice cream section of the DX system is refrigerated by a direct expansion type evaporator made up of about 70 feet of ⅝-inch copper tubing in a compact coil with a header plate, so that the coil occupies the same space as the former 41X and 43X evaporators. The direct expansion type evaporator is constructed to give the highest possible back pressure for the required ice cream temperatures. This back pressure is considerably higher than was possible with the previous low side float evaporator, and increasing the condensing unit capacity decreases the running time and power consumption.

The ice cream section of the Simplex fountain is refrigerated by direct expansion refrigerating plates, the same as have always been used in the Simplex line. However, a drier loop of ½-inch tubing has been added to further dry up the refrigerant before it leaves the ice cream compartment, thereby taking advantage of the full refrigerating capacity of the plates.

The refrigerant flow in both models is controlled by a TEV-F207 valve. The TEV-F207 has a liquid-charged thermostatic element which eliminates any possibility of erratic operation that might occur due to transfer of the thermostatic charge in the case of gas-charged power elements. The valve is located accessibly in the dry storage compartment so that it may be adjusted at any time without removing any cover plates. The valve as used on these fountains is adjusted at the factory to a setting of 7 degrees of superheat which is slightly lower than the 10 degrees standard superheat setting, for it was found 7 degrees gave slightly better operation. In most cases it will not be necessary to readjust this valve in any way at the time of installation.

Be sure that both the expansion valve and switch control bulbs are pushed all the way in to the bottom of the bulb wells on this evaporator.

Syrup Rail-Water Cooling Sections

The syrup rail of both fountains is refrigerated by a single loop of ½-inch tubing which is connected in series with the water cooling section evaporator, this latter being made of ⅝-inch tubing. The refrigerant flow is controlled by a thermostatic expansion valve (TEV-F207 Automatic Products), the refrigerant passing first through the syrup rail evaporator, then to the water cooling section evaporator and out through a thermostatic regulating valve (TRV-20), which controls the ice formation. The TEV-F207 control bulb is clamped tightly to the fourth coil from the top at the front side,

* General Service Manager, Liquid Carbonic Corp., Chicago.

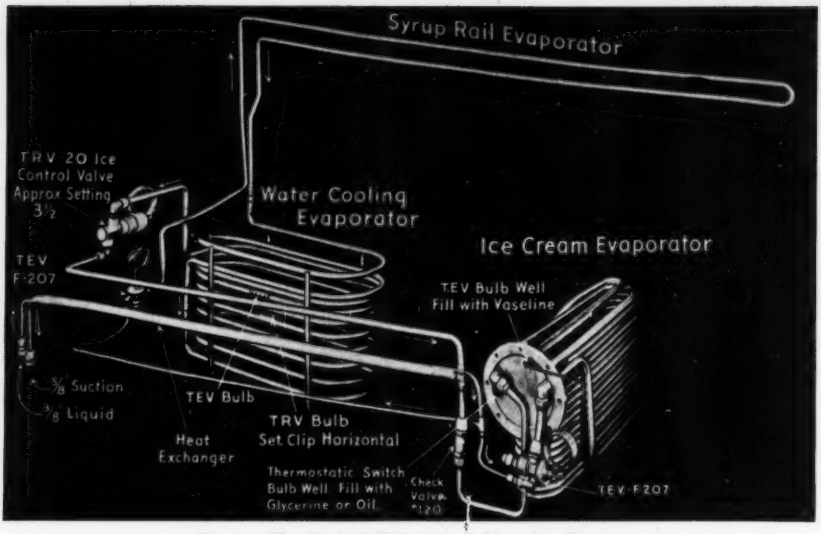

Fig. 1. The "Liquid" DX 1940 Refrigeration System.

which gives one drier loop before leaving this evaporator, while the TRV-20 bulb is clamped in a stainless steel clamp attached to the sixth coil from the top, also at the front side. This clamp should be *horizontal* and the final TRV adjustment will be at approximately 3¼ to maintain the desired water cooling section ice formation. The TRV-20 has to be set colder on these DX fountains because the higher operating back pressure has resulted in a shorter condensing unit "on" cycle, making it necessary to build back the ice formation in a shorter time, requiring a wider opening or colder setting on the TRV. The TEV-F207 is factory-set to maintain 7 degrees of super-heat at the bulb location, and in most cases it will not be necessary to readjust this valve. Ice should form on all coils of this evaporator.

Heat Exchanger

The suction line from the TRV-20 is tee'd into the suction line from the ice cream section evaporator, and all the suction gas passes through a loop heat exchanger. All the liquid refrigerant from the condensing unit to the fountain passes through the outer tubing, counter flow to the returning suction gas inside the inner tubing.

Check Valve

A check valve is installed at the ice cream evaporator before its suction line tees into the suction line from the water cooling section. This check valve prevents the warmer refrigerant vapor from the water cooling evaporator from condensing in the cold ice cream evaporator during the "off" cycle, which would result in a frost back at the start-up of the next "on" cycle.

Refrigerant Charge

All evaporators, being direct expansion, are shipped dry. Refrigerant and oil must be added at the time of installation by whoever supplies the condensing unit. The approximate amount of refrigerant charge for the water cooling section of the DX fountain is about 3½ pounds, while the charge for the ice cream evaporator is about four pounds. In addition to this, approximately ½ lb. of refrigerant must be added for each 10 ft. of ⅜-inch liquid line from the fountain to the condensing unit. Oil should also be added at the time of installation, in proportions of 1/10 lb. of oil for each pound of the total quantity of refrigerant added to the installation.

The approximate amount of refrigerant charge for the water cooling section of the Simplex fountain is about 3½ lbs., while the charge for the ice cream evaporator is ¾ lb. of refrigerant for each plate, a 20 gal. fountain three plates 2¼ lbs. of refrigerant,

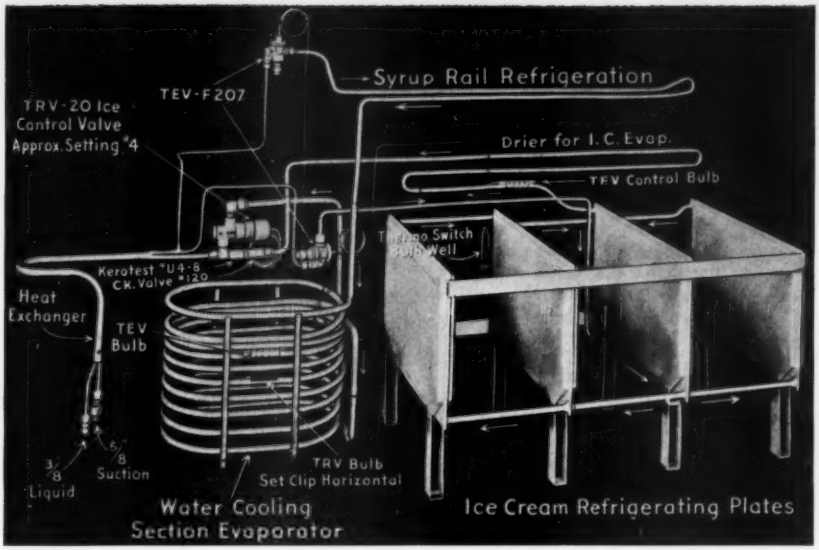

Fig. 2. The Liquid Carbonic Corp. 1940 Simplex Refrigeration System.

a 30 gal. fountain four plates three lbs. of refrigerant, a 40 gal. fountain 8¾ lbs., a 50 gal. fountain 4½ lbs. In addition to this, approximately ½ lb. of refrigerant must be added for each 10 feet of ⅜-inch liquid line and oil must be added at the time of installation, in proportions of 1/10 lb. of oil for each pound of the total quantity of refrigerant added.

Condensing Unit Control

A No. 1122047 Frigidaire thermostatic switch is supplied with the fountain, and this switch alone is sufficient to control the condensing unit and maintain proper fountain conditions on all installations except those which have very heavy water load requirements. Where unduly heavy water load conditions prevail, a low pressure control switch should be connected in, parallel with the thermostatic switch and given settings not lower than 32 lbs. on the cut-in, and not higher than six lbs. nor lower than four lbs. on the cut-out.

The No. 1122047 thermostatic switch is given a factory setting of approximately zero degrees cut-out and four degrees cut-in, and the range adjustment will have to be changed according to local ice cream conditions. The minimum differential on this switch is three degrees, and the four degrees factory setting on the differential will be satisfactory for practically all cases on the Simplex fountain. On the DX fountain it will be necessary to increase the differential to seven degrees. This differential can be obtained by turning the differential adjusting screw one complete turn counter-clockwise.

Recommended Initial Pull-Down Conditions

It is recommended to the serviceman that he start up the condensing unit with both the soda fountain water cooling section and the syrup rail dry, in order to shorten the initial pull-down on any cooler box which has a water bath type cooling section for the sweet and soda water and a water type of syrup cooling arrangement. The serviceman should permit the condensing unit to operate on the dry refrigeration coils of both these sections, so that virtually the full capacity of the condensing unit will be available to pull down the ice cream section hold-over solution or plates as the case may be, removing the heat from this latter section as well as the entire cooler box. The condensing unit should operate for at least two hours, and longer if possible, before putting the water in the syrup rail and water cooling sections.

The advantage of this method of starting

up is that the head pressure will be lowered much faster on the condensing unit and, consequently, its capacity to remove heat maintained at a maximum due to the lower head pressure. This results in a faster initial pull-down on the entire cooler box. It will also be possible to open the condensing unit suction valve wide sooner and thereby permit the condensing unit to operate at full capacity without overloading.

During the initial pull-down with the water cooling and syrup rail sections dry, the condensing unit has only to remove the heat and lower the temperature of the hold-over solution or plates, cool the lining and interior, and reduce the air temperature within the cooler box, which will be accomplished with rapidly decreasing head pressure. The syrup rail and water cooling evaporators will, of course, frost up. This will throttle or close off its thermostatic expansion valve, lowering the back pressure and the head pressure and result in the condensing unit pulling almost entirely on the ice cream section, rapidly lowering the ice cream section temperature. After the condensing unit has operated this way for at least two hours, most of this heat will have been removed, and then the adding of the water bath loads will not result in as long a pull at high head pressure during the removal of the sensible and latent heat in forming the ice in the water baths.

In filling the water bath with sweet water, do not fill too full because as ice forms on the evaporator coils, the expansion of the water in freezing to ice will lift the level of the water. Fill with sweet water to about the second block tin coil from the top, and when ice has formed, the level will then just about cover to top loop of the water cooling coil.

Adjustments

In general it will not be necessary to make any adjustments on the expansion valves for they are factory set for 7 degrees of superheat at the bulb location. In the water cooling section, ice should form on all the coils of the evaporator and build out about ½ inch beyond the ARV bulb. If the evaporator is frosting back excessively through the TRV-20 valve, the TEV-F207 is open too far and the adjustment should be turned clockwise (looking at the adjustment end of the valve) to close off the valve slightly. Turning the adjusting stem clockwise on the TEV-F207 Automatic Products thermostatic expansion valve raises the superheat and passes less refrigerant, while counter-clockwise decreases the superheat, passing more refrigerant. (Adjustment of this valve is just opposite that of the Frigidaire TEV-18 where turning the adjusting nut clockwise opened the valve passing more refrigerant). A 3/16-inch key wrench will fit the adjusting stem.

The TRV-20 should be adjusted so that ice forms out to and slightly beyond the TRV control bulb with the bulb clamp set in a horizontal position. The setting to obtain this ice formation will generally be about position "4" on the valve.

The TEV-F207 on the ice cream section evaporator should frost the suction line just outside the evaporator header plate. Only minor changes should be made, if any, in the adjustment of the expansion valves over the factory setting, and no attempt should be made to readjust them until the entire fountain has attained normal operating conditions.

On all water cooled condensing units, the water control valve should be adjusted to maintain approximately 118 lb. head pressure.

Use Sight Glass

A liquid line sight glass must be installed on each installation in the liquid line near the condensing unit and preferably in a vertical liquid line, for without the sight glass it will be virtually impossible to determine whether or not a job is short on refrigerant. This sight glass will more than pay for itself through facilitating the locating and correction of trouble by the service man, and particularly enable him to readily determine when he has sufficient refrigerant in the system without the necessity of guessing or leaving excessive overcharge in the unit. A shortage of refrigerant will cause irregular operation of the expansion valves, which readjustment of the valve itself will not correct.

When checking the flow through a liquid line sight glass, the condensing unit must be operating. If there is sufficient refrigerant in the system, the flow through the sight glass will be clear and colorless and there will be no apparent movement within the glass. If short of refrigerant, a flash or foaming refrigerant will show passing through the sight glass.

One of the better known dehydrators should be used to completely dry out the refrigerant, connecting lines, and entire system on each installation.

On fountains on which an agitator motor

is used, the switch bulb should be located in a bulb well attached to the water cooling compartment tank bottom inside the block tin coils, in order to obtain more frequent cycling of the agitator. The agitator switch is given a factory setting of 37 degrees cut-out, which should not be lowered. This location of the bulb gives decidedly better operation of the agitator compared with the former location on the inlet to the block tin coil.

Changes for SO_2 and Methyl Chloride

If it is desired to use SO_2 or methyl chloride as the refrigerant on either standard fountain, the only changes necessary will be to replace the two TEV-F207 Freon valves supplied as standard with TEV-S207 Sulphur Dioxide or TEV-M207 methyl chloride valves and to change the high pressure cut-out on the thermostatic switch from 185-190 lbs. to 140-145 lbs. for SO_2 and to 175-180 lbs. for methyl chloride. All thermostatic expansion valves will have ¼-inch inlet and ½-inch outlet connections as standard.

When SO_2 or methyl chloride is specified in the original order and the fountain is shipped from Chicago, the proper valves will be installed at the factory prior to shipment. In all other cases the changes will have to be made in the field.

When Winter Comes

By G. E. GRAFF*

WITH the coming of winter, refrigeration service work is less and, of course, the service man's income is less. This is a good time to sit down and analyze yourself and your work.

In the majority of cases you have had to wait for a 'phone call. The service call came in when it was absolutely needed and not until then, and there wasn't very much that you could do to create business other than offer your services, to advertise possibly, and then wait until the service call came.

Do Not Wait for Buyers

If the specialty salesmen just depended upon their advertising and waited until someone came to them to buy, there would have been very few refrigerators sold. The salesman goes out, rings door bells, digs up prospects and does everything that he can to locate new prospects. He creates business.

There is no reason in the world why the service man should not go out and create business, and during this period of the year when service work is less, in this way he can do a lot towards increasing his income.

If your work in the past has been good, if you have rendered good, conscientious service to your customers, you have gained their confidence and now you can go to them with suggestions because of this confidence.

Your success in promoting new winter business is undoubtedly to a great extent dependent upon how good a service man you have been, how well you have served them, if you have used a good approach and have done your work well.

Recently a Canadian service man said that he had work enough lined up now to take care of him and if his 'phone didn't ring for three months he would still be busy. That indicates good far-sighted management. He was looking to the future and now he has a good dependable income all winter long.

It is not too late for you to keep this work in mind. You can start out right now and produce a lot of business for the remainder of this winter.

Just stop and think over what you did last summer in the rush of immediate service work. Didn't you often just get the machine running and be sure that there was refrigeration? Isn't it true that there were many things that you could have done to improve the customer's refrigeration that you didn't do then, or many things that you saw wrong that you did not attempt to correct at that time due to your rush to get on another job?

How Many Can You Recall?

Old machines that are fairly well worn and have lost their original efficiency. Remember that on a household refrigerator, often the old machine which has lost its ef-

* Ranco Inc., Columbus, Ohio.

ficiency runs so long to get down to the old cutting-off point that the long running cycle cools the box far more than is necessary. This machine could be rebuilt to renew its efficiency. You know of many ways that you could improve it.

Overloaded Compressors

Many compressors are too small now because of added evaporators or poor engineering in the first place.

In many cases old-fashioned coils should be replaced to improve the efficiency. Sometimes they were too small and other times the load has increased, or possibly you could improve the operation of some of these coils by adding a heat interchanger. There is always the drier that you may have put on last summer that should be changed or taken off now that it has served its purpose.

Think of the commercial installations as well as the household refrigerators, where the old door gaskets are entirely worn out and should be replaced, and of the hardware that is worn and should be replaced.

There are always belts that need replacements due to wear, or motors out of line. There are motors that should be oiled and possibly have new bearings.

Don't you remember some compressors that were running a very high head pressure that really should have a larger condenser, or air-cooled compressors that should be changed over to water-cooled, or water-cooled that would be much better if replaced by air-cooled compressors?

Domestic Refrigerators

There are many household refrigerators that should be refinished and some of the older ones that the insulation is moisture-soaked. The panels should be removed and the insulation taken out, dried and replaced, sealed properly, or should be entirely replaced by new insulation.

In fact, there are a lot of jobs that should be entirely rebuilt and any good service man ought to be able to do most of this work himself.

Many water valves are not seating properly and water pipes stopped up, and in many cases water-cooled condensors are limed up and should be cleaned out.

There are expansion valves that should be replaced by newer types. No doubt you remember a lot of expansion valves that are the wrong size in the jobs that they are attempting to handle.

Controls are the thing that we are most deeply interested in and there are many uses for new controls on old installations.

There is Ranco's line of household replacements that may be used to bring the old jobs up to date and improve them in many ways. Many of the old controls had plain copper contacts that are burned and there are also those old jobs that did not have cold control.

In commercial refrigeration there are many old installations that could be materially improved by a new control.

In many cases where a pressure control is being used, a temperature control would be far better. For example—flower storage, water coolers, ice cream cabinets and other places for two-temperature control.

This can easily be explained, easily installed and you can make a good profit from the installation and render your customers a real service. There is literature which is available to you and which will assist you in selling this particular control.

Ask your jobber for this literature and he will be glad to furnish it to you and cooperate with you in furnishing information to sell jobs.

S S S

ANOTHER APPLICATION FOR REFRIGERATION

SEEKING a better-conditioned tree seedling, nursery storage cellars at Pullman, Washington, are turning to air conditioning to help preserve tree seeds over long periods of time, it was revealed by Donald French, vice-president in charge of research, Carrier Corporation, Syracuse, N. Y.

Stored tree seedlings will be kept in a dormant state for long periods in controlled temperature of 40 degrees provided by refrigeration units in three rooms of the storage cellar. According to Mr. French, it has been found that the controlled temperature possesses factors which make for a well-conditioned tree seed.

The installation, which was contracted for by the soil conservation service of the United States Department of Agriculture, was expected to be completed by September 15.

During the Summer, the cooling units look after the seedlings automatically, while in the Winter, a warmer touch is given them. One of the storage rooms air conditioned is 18 by 25, while the other two are 12 by 18.

Rate of Flow in Capillary Tubes

QUESTION BOX: I wish to compute the rate of flow of liquid sulphur dioxide through lengths of capillary tubing. All the available data and formulae that I have used has been for sizes ⅛-inch O.D. tubing and larger. This has resulted in such a wide variety of answers that I am skeptical as to the correct formula and friction coefficient to use. I have assumed the room temperature at 70 degrees Fahrenheit and that the liquid flows by gravity from a container through the capillary tubing. Any information you can supply will be greatly appreciated.—*H. R. Ashby.*

H. R. ASHBY: Your experience with computing the rate of flow of liquid through various lengths of capillary tubing is probably the experience of most of us when using standard formulae. These formulae, being theoretical, apparently do not take into consideration all the variables which may be encountered. I do not have a formula which would be any better than those you have used, and from past observation, it appears that the only authentic manner of arriving at an answer to such problems is by experiment.

I don't believe it would require a great deal of equipment to set up a means of determining the rate of flow by actual tests. I have in mind, for instance, using one of the rapid drum chargers such as is sold on the market today. In the June issue of THE REFRIGERATION SERVICE ENGINEER, you will find described a refrigerant transfer unit, or rapid charger, built by E. S. Diggle from three heat exchangers. This is a very simple manner of building one of these rapid chargers and they are a useful device for charging drums in the shop.

If you could utilize this idea by connecting a large drum to one side of the unit and the desired lengths of capillary tubing to the other side between your small drum and the charger, you could set up a definite pressure difference between the outlet and inlet of the capillary tube simply by controlling the temperature of the liquid passing through the rapid charger. By weighing the amount of liquid that passes through the capillary tube within a definite length of time, you can arrive at a fairly accurate flow. By varying the pressure difference between the inlet and outlet over a wide scale, and by using different sizes of capillary tubing, it would be possible to make up a useful reference chart.

This is information that we have been anxious to receive for quite some time, and we would like to receive any completed data you may obtain for future publication.—*Editor.*

QUESTION BOX: Referring to your letter of June 4, since then I have conducted a number of experiments along the lines that you suggested and I have obtained some very useful data. You may use it for publication if you wish.—*H. R. Ashby.*

Test Set Up

Instead of using a rapid charger as a means of cooling the refrigerant before it passed through the capillary tube, we used a beverage cooler which we happened to have in our shop, and cooled the small drum into which the capillary tube discharged the refrigerant. The temperature of the beverage cooler was maintained at 35 degrees F. and the pressure in the small drum receiving the refrigerant varied between 12 and 15 pounds. Fig. 1 shows the complete layout used in these tests.

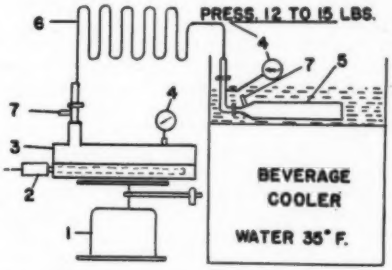

FIG. 1—THE TEST EQUIPMENT

1—Beam Scale
2—Chromolax heater
3—Generator
4—Pressure gauges
5—Five pound drum
6—Capillary tube
7—Valves

In order to vary our pressure at the inlet of the capillary tube, a 500 Watt Chromolox one-inch-diameter heater was inserted in the

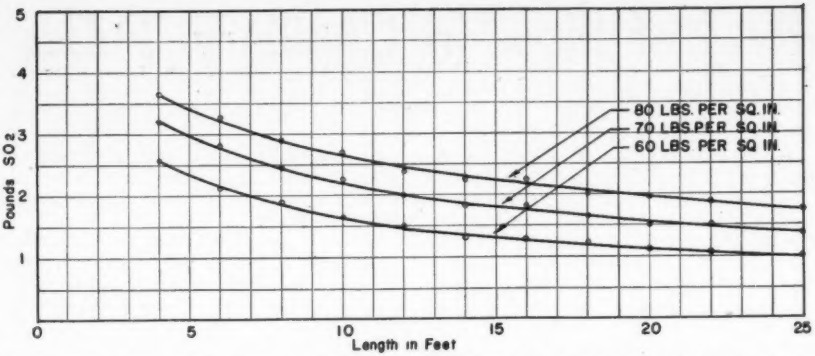

Fig. 2—Flow of Sulphur Dioxide through .032 inch inside diameter hard drawn copper tubing in pounds per hour. Pressures indicated on each curve were inlet pressures. The back pressure in each case was 12 to 15 lbs. Data compiled by H. R. Ashby, American Refrigeration Co., San Francisco, Calif.

drum containing the SO_2. This entire assembly was mounted on a balance scale and the weight of the refrigerant contained in it noted before and after each test was made.

Method of Running the Tests

Referring to Fig. 1, generator 3 was charged with about four pounds of SO_2. The tests were started with 25 feet of capillary tubing. Through the use of the Chromolox heater inserted in the generator, pressure in the highside of the capillary tube was built up to 60 pounds. The weight of the generator was taken on the scales and the test was run for 30 minutes with the pressure maintained as closely as possible to 60 pounds. The weight was again taken, the difference being the amount of SO_2 that had flowed through the capillary tube during the 30-minute period.

Next the generator was heated until the pressure rose to 70 pounds, and the same procedure was followed. After taking the tests at 80 pounds, the length of capillary was reduced to 22 feet and the same series of tests were repeated for the three different pressures. After each series of tests two feet were taken off the capillary tube and the amount of SO_2 that passed through the tube at each of the three pressures was weighed. This test was continued until only four feet of capillary tube remained.

As the results were obtained, they were tabulated and eventually plotted on graph paper. The curve shown in Fig. 2 is the final results. It will be noted that the flow in the curve is given in pounds of SO_2 per hour and it should be remembered that the pressures of 60, 70, and 80 pounds are not pressure differences, but are the pressures applied to the inlet of the capillary tube. There was a back pressure of 12 to 15 pounds on all these tests, as indicated in Fig. 1.

WELDING AND SOLDERING MONEL METAL

WELDING of Monel by both gas and electric methods is done readily. The flame in gas welding must be close to neutral, on the reducing side, and the work must be done rapidly and without rewelding. Gas welding is done with the aid of a special flux. Metallic arc welding is readily accomplished on material of gauges suited to this method of welding. Dense welds of high strength and excellent ductility are obtained. Flux-coated welding rods should be used for arc-welded joints. Electric seam welding is adaptable for joining thin gauge sheet. Monel may be welded readily to weldable dissimilar wrought metals.

Soft-soldering is a convenient method of joining the lighter gauges. Either a high or low tin solder works well. Brazing with silver solders is used to give strong joints where especially corrosive substances are being handled.

H. Salzman,
California.

Please send me duplicate of July, 1939 of THE REFRIGERATION SERVICE ENGINEER. I have misplaced this copy and miss it as another page in a book. I have my copies from 1937 and find them as handy as any reference book I have.

The Question Box

Readers are invited to send their problems pertaining to the servicing of household refrigerators and small commercial refrigerating equipment as well as oil burners to "The Question Box."

CROSLEY UNIT BOUNCING

QUESTION 395: In the Crosley refrigerator of the one-cylinder reciprocating compressor mounted in the top of the cabinet, the top cover is quite close to the top of the compressor. At times, the compressor would vibrate or jump so as to hit the top cover and make a very distressing noise; this trouble may develop at any time, and although I have worked on it, I have never been able to cause a permanent cure. Sometimes, the trouble will stop all by itself and may not recur again for a considerable time.

I have added gas and oil to the compressors, first one and then the other, but it seems to bring about temporary relief only, and I am inclined to believe the trouble is due to the one-cylinder compressor and the valves not working properly, and when it operates for a short time, the valves seat properly and it then runs all right again. What is your advice on the trouble?

ANSWER: There are probably two things that can cause the condition you are experiencing with the Crosley refrigerator.

The first of these is an overcharge of refrigerant, which permits a certain amount of the refrigerant to reach the compressor during the first part of the on-cycle, thus causing oil slugging and the jumping of the refrigerating unit. This first possibility, of course, can be readily checked by noticing the temperature of the suction line during the operating period. If there is a tendency for it to sweat or frost at any time during the operating period, you can be sure that this is your trouble.

The second possibility is that the machine is located in rather a cold location, and that during the long off-period, a certain amount of refrigerant will condense in the cold crank case of the compressor, and when it starts again on the on-period, this refrigerant is drawn off from the coil gradually, but in doing so, it carries a certain amount of oil with it, creating the oil slugging condition. Troubles of this sort, of course, are more usual during the winter time and the colder weather, and will usually occur only on those machines subject to temperatures of 50 degrees or less. Adding oil to the compressor will probably make the situation worse; the remedy, of course, for the above situation is indicated by its cause, and if it is possible to get the machine into a warmer location, your troubles will clear up.

NEEDS AUXILIARY CONTROL

QUESTION 396: I was called on a commercial job consisting of a water-cooled Frigidaire unit of the old style with the pressure control, an 8 x 8 walk-in cooler with three lowside float evaporators and a display case 10 feet long with a lowside float and finned evaporator, a header on each end. The display case is controlled with a snap-action two-temperature valve of the old type, with the adjustment springs in a barrel on the side.

When we were first called, the middle evaporator was not frosting, while the outside evaporators were a solid cake of ice. The shut-off valves on the outside of the box were so rusted that the stems were completely gone on some, and we found that the refrigerant was not passing through the center one. We replaced all the shut-off valves and told the owner to defrost the coils. After the coils were clear, the display case had a tendency to warm up, and as it appeared to be oil-logging, we had the float repaired.

After the case had warmed up still more, we tore the old shut-off valves apart and found that the valves to the middle evaporator had been shut off, and the owner then told us that the former owner had installed the walk-in box, then some time later the display case. Apparently, the middle evaporator has been shut off ever since.

At present the unit will hold the walk-in cooler at 32 degrees and the display case at 35 degrees for three or four days; then the display case warms up about 10 degrees, usually in the morning, and may be normal by

noon. The two-temperature valve was set to shut off just before the unit did—by the way, this takes place with the middle evaporator turned off just as it had been before. What is the cause of this action? and what should the high side pressure be with a city water temperature of 48 degrees? I have tried different pressures on the high side, and changed the differential adjustment, but it makes very little difference.

ANSWER: When engineering a multiple system, it is usual to install the two-temperature valve or snap-action valve to control the warmest fixture on the system, and I take it for granted that when this Frigidaire system you described was originally installed, it was considered that the display case would be maintained at the higher temperature. Therefore, the two-temperature snap-action valve was installed in the suction line of the display case.

Load Conditions Changed

It was probably found, however, that after a period of operation the greatest load, particularly during the daytime, was on the display case, that the walk-in cooler received very little service load once the products were cooled down to the desired temperature. In an effort to balance up the job so that a better balanced condition would be experienced between the walk-in cooler and the display case, one of the evaporators in the cooler was shut off, and it is possible that this helped the condition to some extent. However, it was not correcting the trouble.

In the rules of multiplexing fixtures of different temperatures, we usually state that the fixture with the coldest temperature, or the fixture with the least service load, should be controlled individually by a snap-action valve or a two-temperature throttling valve, and it is usually found that the service load is the factor to be considered, more than the temperature conditions in the fixtures.

An article, started in the April issue of THE REFRIGERATION SERVICE ENGINEER and continuing in the May issue, describes very thoroughly rules and methods of multiplexing commercial refrigeration systems.

To make a long story short, I believe that if you will place the two-temperature valve in the suction line of the walk-in cooler instead of in the display case, then readjust your pressures to fit the situation, you will overcome your troubles. The pressures of the high side should not make any difference to this condition, providing the pressures are high enough to force liquid refrigerant up to the expansion valves, and providing the temperature around the condensing unit is not so low that refrigerant from the evaporators will condense in the compressor during the off-period.

CONDENSING UNIT ABOVE EVAPORATOR

QUESTION 397: I have noticed that recently the McCormick-Deering have begun to manufacture a refrigerating machine. Apparently this machine is similar to any of the various conventional types. The only difference is the location of the condensing unit with relation to the cooling coils. This is the first commercial machine of the conventional design that puts the unit above the cooling coils.

Please explain this matter to me in detail, and if this system can be used on other machines of similar construction. If so, how much higher can the condensing unit be placed above the cooling coils and still operate with maximum efficiency?

ANSWER: While I'm not familiar with the layout of the McCormick-Deering refrigerating system, I do know that the idea of installing the condensing units at a higher level than the cooling unit is by no means new. This arrangement has been used in the past on quite a large number of domestic units where the unit was installed on top of the box. It is also used to quite an extent on commercial applications, such as milk coolers and other self-contained units of this type. I've personally seen quite a large number of walk-in cooler installations where the condensing unit has been installed on top of the walk-in cooler, in order to install it in a place away from any possibility of damage, or because there was no other available space in which to install it.

It is quite commonly used in air conditioning systems, where it is found desirable to install the condensing unit on the roof of the building, or where the first floor of the building may be air conditioned and the unit installed on the second floor. There are quite a number of such applications to be found, and I can't think of any difficulty that may be experienced in this type of installation, with the exception of the possibility of oil return. Where the unit is only two or three feet above the cooling coil, no difficulties would be experienced at all; however, where the distance may be ten, fifteen or twenty feet above the unit, there is a possibility that the oil would tend to trap

in the low side, unless proper precautions were taken.

These precautions, I believe, are mainly in the proper sizing of the suction line, and in the kind of gas used. Methyl Chloride and Freon lend themselves more readily to this type of installation, since the oil mixes so thoroughly with the refrigerant. Due to the fact that the oil separates from sulphur, it may tend to remain in the evaporator.

The sizing of the suction line will govern the return of oil by being sure that sufficient velocity is maintained to carry the oil along with the gas.

BUILDING AN ICE MAKER

QUESTION 398: We are about to start construction on an ice cube maker which will freeze approximately 336 ice cubes in 12 rubber trays with 28 cubes in each tray. Each tray is 10¾ inches long, by 5 21/32 inches wide, by 1 9/16 inches deep, which, no doubt, will give you some idea of the amount of water to be frozen.

Our idea is to make a sheet copper evaporator with four shelves, to take three trays each. To the bottom of these shelves would be bonded copper tubing which will run in one continuous length from inlet to outlet of the evaporator. The tubing that we intend to use will be 5/16-inch OD.

Just what is your idea of this plan? Could we use a smaller tubing, or should we use a larger tubing?

ANSWER: I take it for granted that when building the ice cube maker, you will want to compete with those already on the market to the extent that you will expect it to give just as fast, and just as good performance. Therefore, I would advise that tubing not less than 3/8-inch in diameter, spaced about 1½ inches apart, be used in the construction of the coils.

I don't know of any ice makers that have used tubing of a smaller size, and in fact, for commercial uses, it is recommended that a half-inch tubing, spaced about two inches apart, be used. There would be a considerable length of tubing used in the construction of this evaporator, and probably you know that it is not advisable to have more than fifty feet of half-inch tubing on one expansion valve, in order to eliminate an excessive drop in pressure.

Of course, using 3/8-inch tubing would give a greater friction loss, and in addition, there would be smaller square foot area of primary surface.

Bonding of the tubing to the shelves should be done very carefully so as to get as much contact as possible between the tubing and the shelf without making this contact through solder. Solder does not make a good conductor of heat.

WRONG VALVE SETTING

QUESTION 399: I am having trouble with a domestic twin-cylinder ⅓-hp. Servel refrigerating unit and would appreciate some of your advice on these subjects.

The first call I received was no refrigeration—machine runs. I checked the head and back pressures and found the head pressure to be 60 pounds and the back pressure 16 or 18 inches vacuum. I heated the expansion valve, and when it released the head pressure was 90 and the back pressure about 7 pounds. The machine contained methyl chloride refrigerant. I blew out the gas charge, installed a dehydrator, recharged the machine with new methyl chloride, and it then ran o.k. for about three months.

On another call, I found no refrigeration and a fitting on the head broken, which I repaired, recharging the machine again with three pounds of methyl chloride, since the entire charge of gas had escaped due to the break in the fitting. For two months the machine was o.k., and then I had another call that the machine would not refrigerate properly.

This time, I found the machine operating at 90 pounds head pressure and about five pounds back pressure. I removed the expansion valve, found the interior of the needle and screen very clean and not clogged; I then removed the cap from the bellows and found some oil on the outside of the bellows and about 8 drops of water. I cleaned the bellows and tested the valve with 90 pounds pressure for a bellow and seat leak, but found it o.k. I installed the valve and started the machine, and it appeared to operate all right.

Machine Runs Too Long

The complaint now is that the machine runs too long. The temperature in the cube chamber was approximately eight degrees F. after the machine had operated for about one hour and 20 minutes. I believe the brine tank capacity is about three gallons. The back pressure is now about two or three pounds, and the head pressure 90 pounds, but the machine will operate about two hours before stopping and then perhaps off cycle for about two hours. The cold control is all right. They say the box temperature

is about 50 degrees F. They have tried to keep the box temperature about 40 degrees F. with the same cold control setting. I am going back for another check up.

Here are a few things that now seem possible to me: That the compressor is not efficient and may need rings and new valves. Is it possible with a cold control that by setting an automatic expansion valve I am starving the evaporator of refrigerant with a back pressure of two pounds? Do you think that if I opened the expansion valve some more I would have better results? It does not seem that way to me, because if the compressor is efficient enough, the suction should open this valve nearly as far at a two-pound setting as at 8 or 9 pounds setting. What is your opinion on this subject?

ANSWER: Your present trouble with the Servel unit is due to an improper setting of the expansion valve. If you starve the evaporator by reducing the pressure on the expansion valve, you will get an extended period of operation.

The proper method of adjusting is to set the expansion valve with the highest possible back pressure, but at a point where the suction line does not frost. In other words, the proper setting is determined by gradually reducing the back pressure until the frost line returns to within two or three inches of the evaporator when the machine is down to its proper temperature. By reducing the setting below this point you are not utilizing all of the coil in the evaporator, or in other words, the evaporator is being starved of refrigerant.

After the proper expansion valve setting has been obtained, then the temperature setting should be adjusted entirely by the cold control.

With an expansion valve installed on a brine tank, the back pressure should be about seven pounds.

"PECKING" NOISE FROM COMPRESSOR

QUESTION 400: We have a Parr one-horsepower unit with a blower coil mounted in a large cooler used for pre-cooling beer. The box is about 10 feet by 6 feet by 9 feet outside with four-inch good insulation in good condition.

This unit was sold with Freon in it, and since that time, a new expansion valve (thermostatic and Frigidaire make) has been installed and the machine has been changed from Freon to CH_3CL. When we were called on the job, there was a "peck" in the compressor and one-half of the head was cold.

We adjusted the expansion valve to operate at about 15 pounds back pressure, and at times the vacuum gauge will draw down to 10 pounds, then will go back up to 15 pounds. It seems this peck will come in any time whether there is a low or high back pressure.

It seems the expansion valve is sluggish, as the frost line drops down the suction line, and then if we move the adjustment, the lower coil on the evaporator will not frost, but it seems that this pecking will appear any time. I have checked the oil and it is o.k. I would appreciate information on this job.

ANSWER: From the information given, it would seem that the sluggish operation of the expansion valve is causing a very uneven metering of the liquid refrigerant to the cooling coil. This is caused very often by having a valve of too great capacity or with too large an orifice. With either condition, a very small movement of the needle releases more refrigerant at one time than the coil can handle, causing it to flow directly to the compressor in the liquid phase, with the resulting pecking noise.

Wayne W. Phillips,
Connecticut.

Enclosed please find money order for two dollars for which please send me one year's subscription to THE REFRIGERATION SERVICE ENGINEER.

I might add that I know of no better way of investing two dollars. It is the most interesting magazine in my house or shop.

C. H. Wildasin,
Pennsylvania.

Please continue my subscription with November issue as I do not want to miss an issue. I feel that it is the best published magazine money can buy at any price.

Walter S. Palmer,
Maine.

Please enter my name on your mailing list of 1940 REFRIGERATION SERVICE ENGINEER. I could not well be without this book in my refrigerator work. Enclosed you will find $2.00 to cover my subscription.

Howard J. Hill.

Enclosed is $2.00 for subscription to the REFRIGERATION SERVICE ENGINEER for one year. I was greatly pleased with my first year subscription and hope to continue for years to come.

REFRIGERATION SERVICE ENGINEERS' SOCIETY

Official Announcements of the activities of the National Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.

THE OBJECTS OF THE SOCIETY

To further the education and elevation of its members in the art and science of refrigeration engineering; for the reading and discussion of appropriate papers and lectures; the preparation and distribution among the membership of useful and practical information concerning the design, construction, operation and servicing of refrigerating machinery.

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Chicago in January

CONSIDERABLE pressure is being brought to bear on the weather man to see that fair weather prevails when good fellows get together for the 7th annual R.S.E.S. Convention in Chicago, January 13-16.

Here in Chicago will be held the service and installation engineers' own convention. It will be a good tonic to come and fraternize with fellow engineers—to exchange ideas—to secure real practical information from the excellent educational program being planned.

Those members who have attended previous conventions know the value of these annual gatherings. We promise to return you back to your work, inspired to do a better job and with a lot of ideas you can profitably use.

Aside from the business and educational program of the Society you will have the opportunity of witnessing the largest and greatest exhibit of refrigeration equipment ever assembled under one roof. The exhibit is sponsored by the Refrigeration Equipment Manufacturers Association.

All work and no play makes for a dull time so as usual the entertainment features will provide a pleasant relaxation. The All Industry Banquet on Tuesday and the R.S.E.S. party on Wednesday will be memorable events.

The important thing now is to mark your calendar for January 13-16, 1941, and to be on hand for the opening bell.

COMMITTEE PLANS FOR ALL-INDUSTRY EXHIBIT

WORKING out detailed plans for the All-Industry Refrigeration and Air Conditioning Exhibition, the committee of the Refrigeration Equipment Manufacturers Association at a recent meeting outlined a program so that the exhibition activities will move along in streamlined fashioned.

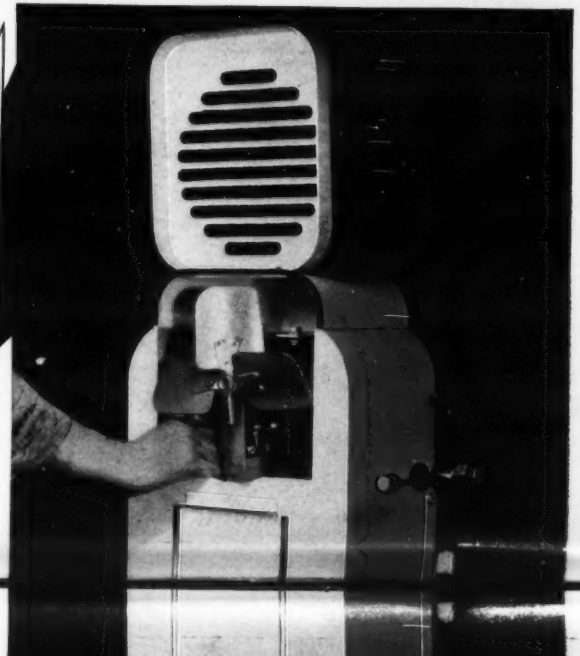
Among the recommendations to be submitted, according to M. W. Knight, Sales Manager, Peerless of America, Inc., and Chairman of the Exhibition Committee, will be several regarding arrangements for registering and badging the attendance at this next show.

Occupying the two floors at the coming

Members of the All Industry Exhibition Committee in a recent meeting. They are left to right: C. H. Benson, Imperial Brass Mfg. Co., R. H. Luscombe, Penn Electric Switch Co., R. M. McClure, Exhibition manager, M. W. Knight, Chairman of the Exhibition Committee, Peerless of America Inc., K. B. Thorndike, Detroit Lubricator Company and Barrett Scudder, Jas. P. Marsh Corp., Chairman of the Registration arrangements committee.

How FEDDERS Unit Coolers give you this EASY ACCESSIBILITY

for oiling motor and adjusting Thermostatic Expansion Valve



EASY AS LIFTING THE HOOD OF YOUR CAR

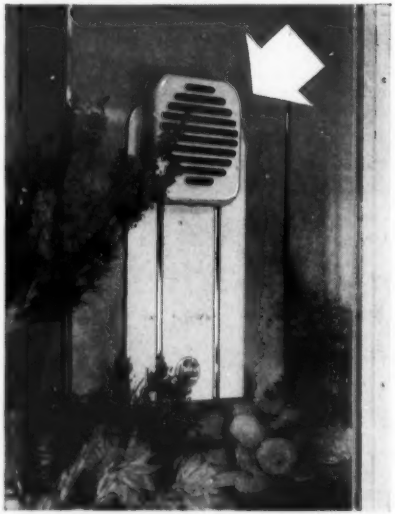
. . . that tells how quickly Installation and Service

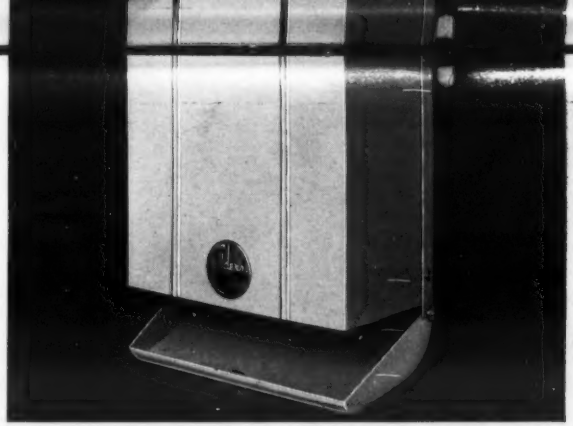
EASY AS LIFTING THE HOOD OF YOUR CAR

. . . that tells how quickly Installation and Service Engineers can reach the interior of Fedders Wall and Ceiling Type Unit Coolers!

The fan grille is instantly removed, thus making disassembly of the entire cabinet unnecessary.

Oiling fan motor and adjusting Thermostatic Expansion Valve is made quick and easy.





Ideal for Recessed Installations

The photograph at left shows a FED-R-LUXE Unit Cooler recessed in a rear panel of a FLORIST'S REFRIGERATOR. This handsome "designed-in" arrangement is made possible because of the accessibility provided by the removable grille.

In display case work, this removable grille eliminates necessity of unloading and removing shelves as would be required if entire cover had to be taken off.

This "LIFT THE HOOD" feature is another example of how Fedders products are engineered to save time and money for Refrigeration Engineers. It pays to Standardize on Fedders . . . see your Refrigeration Wholesaler and SPECIFY FEDDERS.

FEDDERS MANUFACTURING CO., INC.

BUFFALO, N. Y.

Atlanta Chicago Cincinnati Dallas New York Philadelphia
Boston Los Angeles St. Louis Detroit Hamilton, Ontario

show as the next All-Industry Exhibition will, the committee is planning to set up the registration headquarters on the main lobby floor of the Stevens Hotel, practically equidistant from the two exhibit halls, so as to avoid confusion at the entrances on the part of those who have gone directly to the exhibition halls on the lower floor where previous registrations have taken place.

In keeping with the general "On Dress Parade" theme used in the attendance promotion literature for the show, it is planned by the committee to engage a sizable number of "usherettes" clad in drum majorette costumes to work the main lobby floor of the hotel and to guard the entrances to the two exhibition halls. Those stationed at the entrances to the exhibition halls will be charged with the duty of seeing to it that all guests obtain their badges before leaving the lobby floor.

The committee, in conjunction with a special subcommittee appointed to handle the registration work at the convention, also will recommend the use of a combination invitation and registration card again this year—one which can be sent to all guests in advance of the show—so that the same can be filled out before arrival at the registration desk. The committee also is recommending that arrangements be made for advanced registration and distribution of badges on the part of all exhibitors and personnel of exhibitor companies who will be on duty during show week.

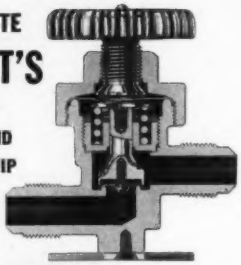
Chairman Knight reports that prospects for another "sell out" of space this year are very promising despite the large number of additional booths which have been laid out. More booths are now under contract for next January's show than were available in the 1940 All-Industry Exhibition.

List of Exhibitors

Acme Industries
Air Maze Corporation
All-Steel-Equip. Co., Inc.
Alco Valve Company, Inc.
Aluminum Company of America
Aluminum Industries, Inc.
American Brass Company
American Hard Rubber Co.
American Injector Co.
Ansul Chemical Company
Arcade Manufacturing Co.
Automatic Products Co.
Black-Sivalls & Bryson, Inc.
Bonney Forge & Tool Works
The Bush Manufacturing Co.
Business News Publishing Co.
Brunner Manufacturing Co.
Carrier Corporation
Chase Brass & Copper Co.
Chicago-Wilcox Manufacturing Co.
B. H. Clark Company
Commercial Coil & Refrigeration Co.
Convention Binder Service
Copeland Refrigeration Corp.

FEATURES GALORE

READILY DEMONSTRATE KEROTEST'S LEADERSHIP IN DESIGN AND CRAFTSMANSHIP



- Accessible Hex Wrench hold.
- Cap Stem and Handwheel may be removed as a unit.
- Radius in Forged Brass Cap fully supports Diaphragms when stem is in full open position.
- Metal Seal of Cap, Diaphragms and Body.
- Stainless Steel Spring reciprocating movement of Handwheel.
- Unrestricted Openings equal to inside diameter of Tubing.
- Rigidly attached with case hardened Phillips Recessed Screws.
- Easy Grip Handwheel securely fastened to Stem.
- Positive Metal Seal when Stem is in full open position.
- 4 Metal Diaphragms replaceable with valve under pressure.
- Pressure-tested metal-to-metal Backseat when Stem is in full open position.
- Replaceable flat composition seat insert.
- Raised Body Seat assuring ease of operation and positive seal.
- Heavy steel 4 Hole Mounting Flange, cadmium plated.

KEROTEST
The Original and Genuine
DIAPHRAGM PACKLESS VALVES
KEROTEST MANUFACTURING COMPANY
PITTSBURGH, PA.

ANY OF THESE WELL-KNOWN DISTRIBUTORS OF

KEROTEST

REFRIGERATION PRODUCTS

Stands ready to quickly serve you!

JOBBERS WITH LOCAL STOCKS

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Baltimore, Md.
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Baltimore, Md.
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Bay Shore, Long Island, N. Y.
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A. E. Borden Co.
Bridgeport, Conn.
Parsons Bros.
Brooklyn, N. Y.
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Brooklyn, N. Y.
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Brooklyn, N. Y.
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Brooklyn, N. Y.
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Melchior, Armstrong, Dessau Co.
Buffalo, N. Y.
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Cambridge, Mass.
Melchior, Armstrong, Dessau Co.
Cedar Rapids, Iowa
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Charleston, W. Va.
Air Conditioning & Refrigeration Supplies, Inc.
Charlotte, N. C.
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Chattanooga, Tenn.
Noland Co., Inc.
Chicago, Ill.
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H. W. Blythe Company
Chicago, Ill.
Automatic Heating & Cooling Supply Co.
Chicago, Ill.
Airo Supply Co.
Chicago, Ill.
H. Channon Co.
Chicago, Ill.
Fred C. Kramer
Cincinnati, Ohio
The Merkel Bros. Co.
Cincinnati, Ohio
Williams & Company, Inc.
Cleveland, Ohio
Williams & Company, Inc.
Columbus, Ohio
Refrigeration Electric Supply Co.
Columbus, Ohio
Williams & Co., Inc.
Dallas, Texas
The Electromotive Co.
Davenport, Iowa
Republic Electric Co.
Dayton, Ohio
The W. H. Kiefaber Co.
Denver, Colo.
McComb's Refrigeration Supply Co.
Detroit, Mich.
J. M. Oberc, Inc.
Fort Wayne, Ind.
H. J. Schroeder Co.
Greensboro, N. C.
Hasco, Inc.
Harrisburg, Pa.
Melchior, Armstrong, Dessau Co.
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Marsden & Wasserman, Inc.
Hempstead, L. I., N. Y.
Sid Harvey, Inc.
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Houston, Tex.
Walter Refrigeration Supply Co.
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Refrigeration Supplies Co., Ltd.
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Los Angeles, Calif.
Frank Gillett Co.
Los Angeles, Calif.
Refrigeration Service, Inc.
Los Angeles, Calif.
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Resco, Inc.
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Enochs Sales Co.
New York, N. Y.
Aetna Supply Co.
New York, N.Y.
Melchior, Armstrong, Dessau Co.
New York, N. Y.
Paramount Electrical Supply Co.
Norfolk, Va.
Noland Co., Inc.
Oakland, Calif.
California Refrigerator Co.
Oklahoma City, Okla.
Mideke Supply Co.
Omaha, Neb.
Ruegg Refrigeration Supply Co.
Oshkosh, Wis.
Gustave A. Larson Co.
Paterson, N. J.
White and Shauger, Inc.
Philadelphia, Pa.
Electric Warehouse
Philadelphia, Pa.
Melchior, Armstrong, Dessau Co.
Philadelphia, Pa.
Victor Sales & Supply Co.
Phoenix, Arizona
J. Carl White Co.
Pittsburgh, Pa.
Williams & Company, Inc.
Pittsburgh, Pa.
Wm. M. Orr
Portland, Ore.
Bill Heiber, Refrigerative Supply, Inc.
Providence, R. I.
Rhode Island Supply & Eng. Co.
Reading, Pa.
Larson Supply Co.
Rochester, N. Y.
Melchior, Arm-trong Dessau Co.
Rochester, N. Y.
Ontario Metal Supply, Inc.
Rockford, Ill.
Gustave A. Larson Co.
St. Joseph, Mo.
Bristol Supply Co.
St. Louis, Mo.
R. E. Thompson Company
Salt Lake City, Utah
Peerless-Utah Co.
San Francisco, Calif.
California Refrigerator Co.
Seattle, Wash.
Refrigerative Supply Co., Inc.
Sioux City, Iowa
National Refrigeration Service
South Bend, Ind.
F. H. Langsenkamp Co.
Spokane, Wash.
Refrigerative Supply, Inc.
Springfield, Ill.
United States Electric Co.
Springfield, Mass.
C. P. Payson Co.
Toledo, Ohio
The Heat & Power Engineering Co.
Toronto, Ont., Can.
Railway & Engineering Specialties, Ltd.
Tulsa, Okla.
Machine Tool & Supply Co.
Valley Stream, N. Y.
Sid Harvey, Inc.
Vancouver, B. C., Can.
Fleck Bros., Ltd.
Washington, D. C.
Melchior, Armstrong, Dessau Co.
Washington, D. C.
Refrigeration Supply Co.
Waterloo, Iowa
Winterbottom Supply Co.
White Plains, N. Y.
County Seat Plumbing Supply Co., Inc.
Wilkes-Barre, Pa.
Radio Service Co.
Winnipeg, Man., Can.
Railway & Engineering Specialties, Ltd.
Worcester, Mass.
Standard Supply Co.

FACTORY REPRESENTATIVES

Chicago, Ill. **Detroit, Mich.** **New York, N. Y.** **St. Louis, Mo.**
Dayton, Ohio **Los Angeles, Calif.** **Philadelphia, Pa.** **San Francisco, Calif**

GENERAL EXPORT REPRESENTATIVES

Melchior, Armstrong, Dessau Co., Inc.
300 Fourth Ave., New York City, N. Y., U. S. A.

Curtis Refrigerating Machine Co.
Cutler-Hammer, Inc.
Day & Night Water Heater Co.
The Dayton Rubber Mfg. Co.
Deissler Machine Company
Detroit Lubricator Co.
Dole Refrigerating Co.
E. I. duPont de Nemours
The Electrimatic Corp.
Fairbanks, Morse & Co.
Fedders Mfg. Co.
The Gates Rubber Co.
General Construction Corp.
General Electric (Motor Div.)
General Electric (AC&CR Div.)
Gale Products
L. H. Gilmer Co.
W. A. Hammond Drierite Company
Heating & Ventilating
Henry Valve Company
Iceberg Refrigerated Locker
Ideal Beer Cooler Co.
Imperial Brass Mfg. Co.
Jarrow Products
Kason Hardware Corp.
Kelvinator Division
Kerotest Mfg. Company
Kold-Hold Mfg. Co.
The Linde Air Products Co.
(Unit of Union Carbide & Carbon Corp.)
Marlo Coil Company
Jas. P. Marsh
Master Refrigerated Locker
McCord Radiator & Mfg.
McIntire Connector Co.
Mills Novelty Company
Minneapolis-Honeywell Regulator
Modern Equipment Corporation
Mueller Brass Company
Nickerson & Collins
Northern Indiana Brass Co.
Pacific Lumber Co.
Peerless of America, Inc.
Penn Electric Switch Co.
Perfection Refrigeration Parts
Portable Elevator Mfg.
Ranco, Inc.
Refrigeration Appliances
Rotary Seal Company
Servel, Inc.
Spoehrer-Lange Company
Square D Company
Standard Refrigeration Co.
Superior Valve & Fittings
Tecumseh Products Co.
Temprite Products Corp.
The Texas Company
Tuthill Pump Company
Tyler Fixture Corporation
United Refrigerator Mfg. Co., Inc.
Universal Cooler Corporation
Utilities Engineering Institute
Victor Manufacturing & Gasket Co.
Virginia Smelting Company
J. H. H. Voss Company
Wagner Electric Company
The Weatherhead Company
White-Rodgers Electric Co.
Williams Oil-O-Matic
Wolverine Tube Company
Westinghouse Elec. & Mfg. Co.

New York State R.S.E.S. Meeting All Set

THE first convention of the New York State Association of Refrigeration Service Engineers will be held in Albany, N. Y., November 29-30, at the Ten Eyck Hotel, it was announced in Buffalo by John Bush, president of the new association.

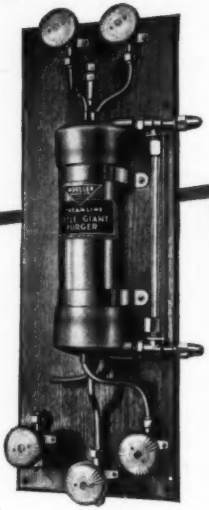
Albany was selected for the convention at a conference in Buffalo between Mr. Bush and George B. Gardner of Schenectady, secretary of the state association. Mr.

Here IT IS!

The New

LITTLE GIANT

Purger



● An essential item and a profitable investment that quickly pays for itself because—

1. It reduces power costs.
2. It saves expensive refrigerant.
3. It reduces wear and tear on equipment.

ORDINARILY when the head pressure of a refrigerating machine ***seems*** to be too high the service engineer ***pumps the system down*** and purges by cracking the purge valve open. He ***hopes*** that the air and other non-condensable gases are concentrated near the purge connection. He ***tries*** to allow all of these non-condensables to escape without the loss of ***too much*** refrigerant.

With the "Little Giant" Purger the chance conditions—the ***seems***—the ***pumps down***—the ***hopes***—the ***tries***—and the ***too muches***—in fact, all the doubts—are eliminated. He ***knows definitely*** whether or not the system needs purging. If purging is needed it can be accomplished without interruption of the plant operation. He ***knows*** that non-condensable gases are concentrated at the purger. He can ***positively expel*** them without an appreciable loss of refrigerant.

Here are the

Advantages of Purging With The "Little Giant"

NO GUESSING— Positive indication when purging is necessary —the sight glass gives visible evidence of non-condensable gases in system.

NO REFRIGERANT LOSS— The air in the system is completely separated from the refrigerant before the purge valve is opened.

SIMPLE TO OPERATE— All operating valves easily accessible. Not necessary to check pressures or temperatures. No need to shut down the system.

POWER SAVINGS— Power savings, due to a reduction in head pressure will pay for the "Little Giant" many times over.

MANUAL OPERATION— Fully manually operated, there is no possibility of a slow leak developing which would cause a loss of refrigerant before cause is discovered.

THE Little Giant **Purger** is mounted on a solid oak panel and can be conveniently fastened to the wall or to other suitable locations. Write us for full particulars and instructions for installation and operation. Order through your jobber.

MUELLER BRASS CO.
PORT HURON, MICHIGAN

Gardner will act as general chairman of the convention. Ernest E. Condon of Flushing, L. I., is educational chairman and Eugene E. Phillips of Rockaway Beach, entertainment chairman. Ralph Davis and Mr. Bush, both of Buffalo, are in charge of publicity.

Mr. Bush said a program for the convention has been drawn up and is now being approved. The state conclave will be a miniature of the international convention, with exhibits, speakers, a banquet and a get-together dinner on the program. Another meeting of the association's board of directors will be held in a few weeks to complete arrangements.

OUR ERROR

IN the September issue a news item on page 40 stated that the Illinois State Convention would be held on Oct. 21 and 22 at Peoria, Illinois.

The dates of this meeting were in error and should be Saturday and Sunday, Oct. 19 and 20.

PROGRAM OF THE ILLINOIS STATE CONVENTION

FOLLOWING a recent meeting of the Board of Directors of the Illinois State Association, announcement was made of the completion of the program and other arrangements for their third annual convention to be held in Peoria October 19 and 20. The facilities and attractions provided by the Association will assure the visitors of a profitable and enjoyable two-day visit.

Saturday Morning

Opening of convention.
Call to order by President McCarthy.
Welcome address by city official.
Appointment of convention committees.
  Resolutions committee.
  Nominating committee.

Afternoon

Opening of convention.
Call to order by President McCarthy.
Invocation.
Report of nominating committee.
Cooling Water for Bakeries and Bottling Plants.
  By Wm. Gauger of Commercial Coil & Refrigeration Company, Chicago, Illinois.
Refrigeration in Photography.
  By James Cernohouz of Clyde Woodworking Company, Chicago, Illinois.
Annual business meeting, reading of minutes of last meeting, reports of retiring officers, reports of committees, election of officers.
Motion picture, "The Middleton Family at the World's Fair." Ladies of the convention invited to attend.

The annual banquet and dance will be held Saturday evening.

Sunday Morning

Call to order by new president.
Demonstration of gas masks.
  By J. R. Fleming, Mine Safety Appliances.
Quiz Contest.
  Conducted by Harry Busby.
Truck Refrigeration.
  A new field for R.S.E.S. men.
Final business meeting.
  Consideration of next convention city.

Chapter Notes

Under this heading will appear news of the chapter meetings. For names of the officers and dates of regular meeting nights, please refer to the Chapter Directory.

LONG BEACH CHAPTER

July 2—A very interesting talk was given by Mr. Harbster of Pacific Metals Corporation. This was followed by a demonstration by Mr. Fox on how easy it is to figure out the size of coils for walk-in coolers so as to be assured of plenty of coil for the job to be cooled. Mr. Fox also distributed Peruco catalogs to the meeting.

William Sluman followed with an interesting talk on the construction of coils and the testing of the finished product.

New members admitted during the evening were Ernie Stevens, Trey Mitchell Langwell, Art Pleshebe and Melvin Luse.

Later on in the evening, a motion picture was shown of the war zone, which included the sinking of the Graf Spee battleship, as well as other ships in the war zone.

The meeting wound up with an enjoyable buffet lunch including beer.

August 2—One of the first orders of business was the appointment by the president of several committees, including a Membership and Investigating Committee, Finance and Executive Committee, Entertainment

• *Investigate this Lower Priced Refrigeration Control* •

FRIGIDAIRE'S PRECISION BUILT "YL" SWITCH

- ✓ One Model for All Common Refrigerants (Freon 12; SO_2; Methyl Chloride)
- ✓ Simpler, More Compact Design
- ✓ More Easily Adjusted—has visible scale for preliminary setting
- ✓ Furnished with Low Pressure or Thermostatic Control
- ✓ With or Without Motor Overload Protection
- ✓ High Pressure Cut-Out If Desired (Comes in double unit case)

Available in various combinations of units to adapt it to every refrigeration need. Differential—Thermostatic type—minimum 3 to 4 degrees, maximum 10 degrees...Low Pressure type—minimum 5 lbs., maximum 55 lbs.

A MODEL FOR EVERY COMMERCIAL REFRIGERATION NEED

Model TOO: (Shown at Left) Thermostatic control without High Pressure Cut-out. Cold Control standard (as illustrated).

Model TOH: Thermostatic control. Includes High Pressure Cut-out. Double unit case. Cold Control standard.

Model LOO: Low Pressure control without High Pressure Cut-out.

Model LOH: Low Pressure control. Includes High Pressure Cut-out. Double unit case.

Overload protection is available in any model as desired.

GENUINE FRIGIDAIRE PRECISION-BUILT PARTS

Write your Frigidaire Distributor today for new low prices. Ask for your copy of descriptive booklet with full details.

TO SATISFY YOUR EVERY REFRIGERATION SERVICE NEED

and Educational Committee, and a Publicity Committee.

The secretary was then instructed to write the San Diego Chapter and start arrangements for the annual Christmas Get-Together.

Some discussion arose regarding the possibility of forming a Ladies' Auxiliary in the territory. However, no action was taken and the matter was tabled until a future meeting.

Soldering Contest

On the educational program for the evening, John Ross of Prest-O-Lite corporation and Mr. Van de Clothier of Kerotest Manufacturing Company were introduced. Mr. Ross gave a demonstration on soldering with the Prest-O-Lite torch. Mr. Van de Clothier and Mr. Ross conducted a soldering contest, in which stream-lined fittings were used. Mr. Bowe and Mr. Travers won the first two prizes with Mr. Warner coming up third.

This contest proved both instructive and entertaining to the onlookers, as well as the contestants. Final scores, after penalties were applied for improper soldering and work out of line, were very close. All the fittings, tubing and other materials necessary to the contest were supplied by Kerotest. The thanks of the chapter were extended to Mr. Van de Clothier and John Ross.

For refreshments following the meeting Arden Frozen Pudding was served.

August 27—The evening was devoted to the annual wiener bake, held at White's Anaheim Landing at Seal Beach, California. Twenty-nine members were present.

Included in the entertainment for the evening was a Spanish dance put on by past President Voepel and Mr. Hammer, to the accompaniment of tin can tambourines. Every one had a good time.

TRENTON CHAPTER

July 1—Considerable time was spent on the reports of the committee arranging a fishing trip for the chapter, and those present were informed that a boat had been obtained at a cost of approximately $2.25 per person.

On the educational program, Harry Jaeger conducted a quiz contest in which all members participated. The contest proved interesting and brought out much useful information.

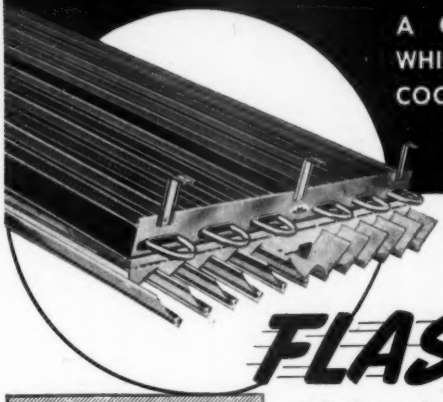
July 28—On this date, the members and friends of the Trenton Chapter embarked on a fishing trip to Portesque. A boat was chartered for the day, and refreshments were served on board, provided by Harry Jaeger of The Radio Hospital. The party caught a total of 372 fish which were eventually divided up among the party. The winner of the prize for the biggest fish of the day was Harry Jaeger. Those who made up the party were: Don Peresett, Doc Aaronson, Herb Jaeger, Harry Jaeger, Al Schweizer,

MEMBERS OF TRENTON CHAPTER GO ON A FISHING TRIP

At the left, Harry Jaeger is shown with the largest fish caught during the day. Upper center, left to right, are master fishermen Geo. Weaver, Sam Cohen, George Frie and Phil Jaeger. Lower center—The man with the sea-going hat is Donald Peresett, President of the Chapter. Wm. F. Aaronson, past president, is shown reeling in his line at the right.

COOLS *without* DRYING!

A GLEAMING BEAUTY WHICH COMBINES SUPERIOR COOLING WITH CORRECT HUMIDITY



Peerless FLASH COOLER

Air circulates in an endless gentle stream through the Flash Cooler

● Fits in anywhere...wide boxes, narrow boxes, walk-ins, reach-ins. Shallow—for ceiling installation in minimum space. Just the right angle to the polished baffles to permit a steady flow of properly cooled air to drift gently downward. Famous Peerless "rifled" tubes, wedge-locked to a perfect bond with the fins—integral Capacity Booster. Looks better, performs better—typically Peerless in every detail of design and workmanship. Look in the big 1940 Peerless Catalog for complete information.

See your refrigeration parts jobber.

Peerless OF AMERICA INC.

Midwest Factory, General Offices—515 W. 35th Street, Chicago

NEW YORK FACTORY
43-20 34th Street
Long Island City

PACIFIC COAST FACTORY
3000 South Main St.
Los Angeles, Calif.

SOUTHWEST FACTORY
2218 N. Harwood St.
Dallas, Texas

EXPORT DIVISION
P. O. Box 636
Detroit, Mich.

Have you got all the business you can handle??

★ If you have, you are the exception. So here's a suggestion that has made extra money for a lot of service shops in the past two years. Go after that Hermetic servicing that you can undoubtedly get in your territory. *Herveen*, the replacement gas for Frigidaire Meter-Misers, enables you to do it. As the demand for Hermetic servicing increases it becomes more and more profitable for the well-equipped shop to handle this work.

HERVEEN
brings in business

★ Why not plan to get this profitable extra business for yourself? Refrigeration jobbers all over the country handle *Herveen*, if yours doesn't, write us direct.

HERVEEN

MODERN GAS CO., Inc.

Manufacturers and Refiners

1084 Bedford Avenue, Brooklyn, N. Y.

Sam Cohen, John Plumeri, George Frie, Don Rose, Paul Frankenfield, George Weaver, John Weaver, Phil Jaeger.

LONE STAR CHAPTER

August 19—Considerable time was devoted at the beginning of the meeting to the business of the chapter. However, on completion of this part of the meeting, the program was turned over to the Educational Committee, and Harry J. Burman gave an informative talk on balanced refrigeration and Dole plates. Mr. Snell followed this with a short talk on good salesmanship.

September 16—One of the first discussions that arose during the evening was one on ways and means of improving the chapter. It was suggested that the chapter try to execute plans which would make the industry a better profession and provide every one with a more profitable business.

A sound motion picture was presented by Mr. Brown of the Dayton Rubber Manufacturing Company, and after this, impromptu remarks were called for from visitors of the evening, including Norman Harper, Art Venson, and G. Scrivner.

A committee consisting of C. C. Coble and D. W. Barron was appointed for the purpose of finding a permanent meeting place.

The drawing of the attendance kitty wound up the evening with Jack Langston proving the winner.

ATLANTA CHAPTER

August 27—The chapter met at the Imperial Hotel in Atlanta, Georgia, and as a prelude to the meeting, those present enjoyed a big steak dinner. When the dinner was finished and the group called to order by Vice President, Charles Biggers, the application of J. E. Parker was presented and accepted by the chapter.

The greater part of the balance of the evening was taken up with the election of officers for the new fiscal year. Those elected were: *President*, Charles Biggers; *1st Vice-President*, M. G. Ogden; *2nd Vice-President*, Joe Stephens; *Secretary*, J. W. Parker; *Sergeant-at-Arms*, Riley Orr; *Board of Directors*, S. A. Mayfield, Chairman, Henry Gullatt, R. M. Graves, C. P. Lee, and George Weldon.

TWIN CITIES CHAPTER

September 10—The meeting was called to order by President Warner, and the first order of the business was the passing for payment of bills incurred by the chapter.

The Membership Committee then presented its report, and Stanley L. Heggen, Kenneth Milton Saldin, and F. J. Leuthner were recommended for membership.

Frank Pond was then appointed by the President as Chairman of the Bowling Committee, to succeed I. L. Rubbelke. In reporting the activity to date, Mr. Pond stated that twelve of the members had turned out for the team tryout.

On the educational program for the evening, a quiz contest was conducted by C. A. McCafferty, and the winners were Mr. Sundgaard and Mr. Schaeffer. Everyone seemed to enjoy this contest, and it was felt that it would be desirable to hold another within a short time. Elmer Johnson's name was drawn for the attendance prize, but due to his absence, the amount was returned to the treasury.

PITTSBURGH CHAPTER

September 13—It had been planned that the film of the last Chicago convention would be shown at this meeting, but because it had been unavoidably detained, it was necessary to cancel the showing.

In order that an educational program could be planned to cover several months in advance, the secretary was instructed to make a poll of all the members by mail, asking for their suggestions on educational features.

By a vote of the membership, it was decided that the future meetings would be held at the Fort Pitt Hotel instead of in the Commonwealth Building.

DAYTON CHAPTER

September 12—This was the first meeting of the fall season, and the meeting was preceded by a dinner in the dining room at the Engineers Club. The National Secretary, Mr. H. T. McDermott, was present as a guest, and after the dinner, gave a most interesting and constructive talk on the operation of the Society.

It was reported that arrangements were now complete for holding all future meetings at the Engineers Club on the second and fourth Thursdays of each month.

Tom Callison presented his application for membership at this meeting, and as it was accepted, he was welcomed to membership in the chapter.

LOS ANGELES CHAPTER

August 14—The educational program was provided by Linde Air Products Company,

"RIGHT DOWN YOUR ALLEY"

Water . . . beer . . . and beverage coolers in every model, type and size to fit each particular requirement. It's easy to find the right cooler for each job in the "Day & Night" Catalog which contains complete information, specifications and useful tables and information.

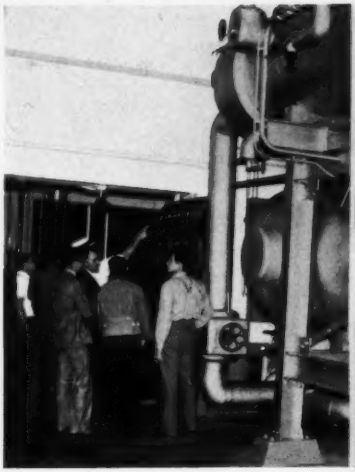
●

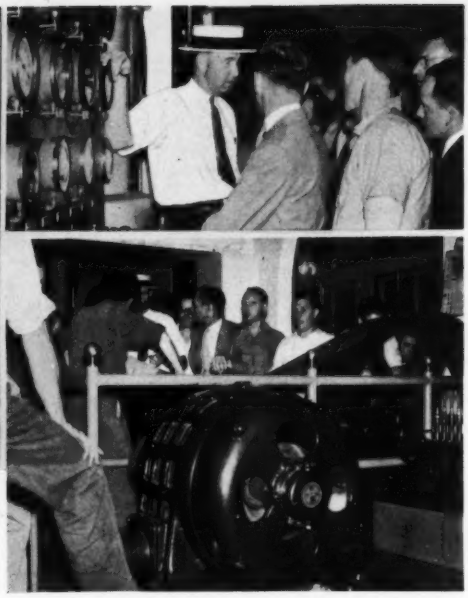
For more than a decade, "Day & Night" has led in the development of "low side" liquid cooling equipment. If you want to build a profitable business with satisfied customers, play safe . . . install "Day & Night" Coolers.

●

WRITE FOR YOUR CATALOG TODAY

COOLER DIVISION
DAY & NIGHT MFG. CO.
2320 EAST EIGHTH STREET
LOS ANGELES, CALIFORNIA
Warehouse Stocks at Convenient Shipping Points





On July 10 the Los Angeles Chapter was taken on a tour of the Los Angeles Brewing Co. plant. Here are some of the interesting interior views.

You can trust these wrenches in tight spots

You can take that "extra turn for safety" with these wrenches . . . without fear of spreading the wrench or having it slip to chew the nut or skin your knuckles. Each wrench has positive, powerful grip in both ends, and boxockets are angle-set to clear obstructions. The 8 tools cover a wide range of nut sizes from 5/16" to 3/4".

Snap-on
Specialized Tools for Refrigeration Service

See Snap-on Tools in your phone directory, or write for complete information.

Snap-on Tools Corporation
Dept. R.S.E.-10
Kenosha, Wisconsin

with an interesting picture showing the welding and cutting of steel. Another picture entitled, "North Sea," and showing views of deep sea fishing provided an attraction of general interest.

Robert L. Parker and Dan A. Wilkins were accepted to membership in the chapter, and because there was no business to conduct at this meeting, the meeting was adjourned.

September 11—One of the first discussions that came up before the chapter was one on Federal Excise Tax. Many points heretofore unknown to some of the members were thoroughly discussed, and much useful information was derived from the airing of the law pertaining to the tax.

A bowling team was organized and entered in the fall bowling league of the refrigeration industry, with John Underwood appointed as Captain and the entrance fee paid by the chapter.

Mr. Bretag and Mr. Witt of Peerless of America, Inc., were introduced by President Payne. Three motion pictures were shown by these gentlemen on the making of Peerless expansion valves, fin coils, and the cutting of Thermek tube.

ST. LOUIS CHAPTER

August 18—This was the date of the St. Louis Chapter Sixth Annual Picnic, and to Entertainment Chairman, E. C. Fix, and President O. E. Petri, goes the credit for the most successful picnic ever staged by the chapter. Various games were held in the afternoon, with prizes for the winners, together with an attendance prize and a guessing contest for women only. The ladies' games for which prizes were offered were won as follows: Peanut race, Mrs. Ruth Winkler; Shoe race, Mrs. H. Clifford; Rolling Pin throwing contest, Mrs. E. C. Fix; Bean guessing contest, Mr. M. Wunderlich. The men's games resulted in the following: Horseshoe contest, Mr. E. Mark and William Steger; Shoe race, S. Nill Mohler; Batting, V. Goldstein; Ball throwing, V. Goldstein. The attendance prize was won by William Steger.

After the games, the fish fry and wiener roast provided the necessary nourishment after a strenuous day. It was not until the moon came out in all its glory that the last of the clan started for home, hot showers, and liniment.

"SO2"
25th
ANNIVERSARY
1915-1940
The best refrigerant yet developed for home use
No other refrigerant has so many points in its favor, so great a performance record, so wide a use. Ansul sulphur dioxide, a guaranteed anhydrous gas, is non-inflammable, non-explosive, non-corrosive. Its pungent odor serves as its own warning agent and makes even the smallest leaks easy to detect. It is still the most ideal refrigerant for the home refrigerator.
ANSUL CHEMICAL COMPANY, Marinette, Wisconsin
ANSUL SULPHUR DIOXIDE
EACH CYLINDER INDIVIDUALLY ANALYZED
AGENTS FOR KINETIC'S "FREON-12"

On August 18, St. Louis Chapter held its sixth annual picnic. The view in the upper left corner announces the location of the picnic and lists the sponsors. The other views are of some of the activities during the day including eating, baseball and an egg race.

There's a Knack to Making Good DOOR GASKETS and Miller HAS IT !

● The "iceless" was in its infancy when Miller first tackled the problem of rubber door gaskets. We've been at it ever since — pioneering new designs and compounds to meet the ever-changing needs of the refrigerator manufacturer. Since each of our replacement door gaskets is an exact duplicate of the original, both in design and quality, doesn't it stand to reason that it is to your advantage as well as the customer's to specify Miller?

You'll find the Miller line complete, too. Its 34 different gasket types enable you to service 80% of all refrigerators regardless of make. Sample card, price list and name of nearest jobber can be obtained by writing—

MILLER RUBBER COMPANY, INC.,
AKRON, OHIO
"Engineers in Rubber"

KANSAS CITY CHAPTER

August 14—This was a special meeting called for the purpose of hearing Mr. Page Edmonds of The Davison Chemical Company, who was the guest speaker of the evening. Mr. Edmonds brought with him apparatus for the demonstration of his product, Silica Gel, and gave a most interesting demonstration of its action on moisture-laden refrigerants.

The rest of the period was spent in open discussion and questions, with Mr. Edmonds answering the questions.

September 10—The meeting was called to order by Vice-President Thompson, and the application of Charles W. Campbell was read and accepted. Also John H. Carroll and Charles W. Campbell were given the obligation of membership by Jules P. DeWilde.

The secretary had the regrettable task of reading Mr. Thompson's letter of resignation, and this was followed by an explanation from Mr. Thompson that it was his intention to leave Kansas City, and that, therefore, it was necessary for him to resign. The resignation was accepted by the group.

On the educational program for the evening, Mr. Thompson presented a quiz contest provided by the National Society.

MADISON CHAPTER

July 19—The meeting was called to order by Vice-President Poster, and the greater part of the evening was devoted to various appointments and miscellaneous business of the chapter.

The educational feature of the evening included a discussion on the hazards and dangers of handling refrigerants.

Beer was served following the meeting.

September 10—Almost the entire meeting was devoted to reports of progress and further arrangements for the forthcoming State Picnic at Tenny Park, and because when these arrangements were completed, there was little time left, there was no educational program included in the meeting.

September 15—This was the date of the Wisconsin State Association Picnic, held at

MARSH

THE GAUGE WITH THE "RECALIBRATOR"

YOU don't need to know any name but the one that appears above to fill all your requirements for refrigeration instruments — and a number of requirements that no other line can fulfill.

Marsh offers the "Recalibrator", for instance, which enables you to restore the *original* accuracy of any Marsh Gauge or Dial Thermometer with the twist of a screw driver; the patented stabilizer which protects gauges from sudden shocks; the patented dial arrangement which provides easily read one-pound divisions in the low pressure ranges.

In addition to the standard instruments, Marsh offers the "Serviceman" remote reading indicator, and a complete line of small portable recorders—temperature, pressure, operating cycles and humidity—built to highest standards but available at remarkably moderate prices.

Write for latest refrigeration industry catalog

JAS. P. MARSH CORPORATION

2059 Southport Avenue — Chicago, Illinois

REFRIGERATION INSTRUMENTS

Tenny Park in Madison. The picnic proved to be a very successful event, with visiting members from Oshkosh, Milwaukee, Rockford, Illinois, and several manufacturers' representatives from Chicago and other points. About 150 men, women, and children enjoyed the various games and contests provided.

WORCESTER CHAPTER

September 17—This was the first fall meeting and was held at the Aurora Hotel. The President announced that due to the long educational feature of the evening, all business would be omitted. He then introduced Mr. Kearney of the Ansul Chemical Company and Mr. Binns of the Virginia Smelting Company. Mr. Kearney gave an instructive talk on the manufacture of SO_2, illustrating his talk with charts. Mr. Binns followed with a very complete film in color, giving the actual picture of what Mr. Kearney had described in words. Following this, there was an informal discussion, led by Mr. Binns, on the three most popular gases.

The serving of beer and sandwiches concluded the evening, while the secretary arranged that all guests were introduced and that everyone became thoroughly acquainted.

NIAGARA FRONTIER CHAPTER

The Niagara Frontier Chapter of the Refrigeration Service Engineers Society held its initial meeting of the Fall season in the Tudor Arms Hotel in Buffalo. John Muller, president of the chapter, presided.

John Bush, chairman of the educational committee and vice president of the chapter, announced that a series of programs has been planned for the coming year in which manufacturers' representatives from all parts of the country will come to Buffalo to address the Niagara Frontier group on educational subjects. The next meeting of the chapter will be held September 18.

S S S

IMPERIAL BRASS TO CONDUCT NEW CONTEST

THE Imperial Brass Mfg. Co., 1204 W. Harrison St., Chicago, announces a new contest open to every one including the pencil pushers, as well as the tube benders of the industry.

All you have to do in this contest is comply with the rules, writing a letter on the subject of "Why I Prefer Imperial Triple

NO BACK ORDERS ON THIS BIRD....

When you order any unit of the popular Virginia line of low-pressure refrigerants, you can depend on *prompt* delivery. We have spent thousands of dollars to perfect our delivery service to avoid Back Orders which mean loss of profit for you.

Modern business machines—efficient personnel—unique transportation facilities guarantee prompt delivery.

BUY YOUR KINETIC'S FREON-12* VIA VIRGINIA
*Reg. U. S. Pat. Off.

EXTRA DRY ESOTOO · Methylene Chloride · V-METH-L

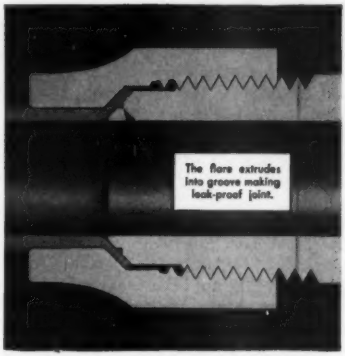
VIRGINIA SMELTING CO.

Located at tidewater
WEST NORFOLK, VIRGINIA

V VIRGINIA

Seal Fittings." The contest closes December 15.

There will be prizes for every one with the best ten entries drawing cash, ranging from $100 to $5. Duplicate prizes will be awarded



IMPERIAL TRIPLE SEAL FITTING

in case of ties. The contest rules are as follows:

1. Write a letter giving the reasons why you prefer and have used Imperial Triple Seal Fittings.
2. Pick out a system which you installed or serviced using Imperial Triple Seal Fittings and be sure to give the following information.
   (a) Date of Installation or Service.
   (b) Location.
   (c) Type and Size of Unit.
   (d) Number of fittings used.
   (e) Name of Jobber from whom fittings were purchased.
3. Draw up a diagrammatic sketch of the system showing the tubing layout and the location of Triple Seal Fittings and any other Imperial accessories that went into the job.
4. Include a photograph of the system if you have one or can readily get it. (This is not a requirement of the contest.)

Entry Blanks Can Be Secured from Jobber

For your convenience, Imperial has prepared forms on which you can write your letter and draw your sketches. The use of the forms will not be required. Jobbers selling Triple Seal Fittings will have them.

All letters, sketches, etc., should be mailed

MOISTURE TROUBLES? FREEZEUPS? NOT A SINGLE COMPLAINT SINCE USING

THAWZONE

Fully Protected by U. S. Patents

The PIONEER FLUID DEHYDRANT

Despite your most careful work, moisture often will remain in a system to cause trouble. The cure is simple. Just add a little Thawzone before starting up. Only 1/8 ounce, costing 10c, protects each pound of refrigerant. The system remains chemically dry—costly call-backs are avoided. As a cure or a preventive of moisture troubles, use Thawzone. Your jobber has it.

Destroys Moisture
Clears Freezeups
Keeps Systems Dry
Neutralizes Acids
Prevents Corrosion
Inhibits Copper-Plating

WRITE for 12-page, technical folder "Modern Dehydration" explaining Thawzone technique.

HIGHSIDE CHEMICALS CO., Newark, N. J.

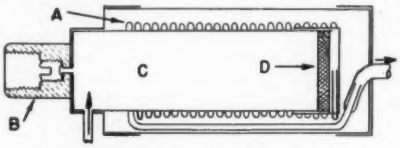
to The Imperial Brass Mfg. Co., at Chicago.

The contest will close December 15, 1940, and the winners will be announced at the All Industry Convention in January.

* * *

A NEW CAPILLARY TUBE REPLACEMENT

SOLVING the difficult problem of obtaining replacements for high side float valves and low side floats with spun headers, the American Refrigeration Co., 580 Minna St., San Francisco, California, announces a combination control valve, dehydrator and



NEW CAPILLARY REPLACEMENT

A—Capillary tube
B—Charging valve
C—Dryer
D—Filter

heat exchanger built on the capillary tube principle.

The chief objections to the use of capillary tubing have been the circulating oil problem and the difficulty in determining the correct length of capillary to use.

In the absence of any available data or formulae for computing the flow of refrigerants through small diameter tubing a series of tests were made with different refrigerants and various lengths of capillary under constant pressures. Using this data and experimenting with various size boxes, it was found that the length of capillary required depends on the refrigerant used and does not vary within a certain range of capacities from four to six cu. ft.

The warm liquid refrigerant enters the valve through the ¼-inch line at the top and drips down through the Silica Gel drying agent where it gives up any moisture it might contain. It then flows through the screens and the filter and into the capillary tubing which is coiled around the dehydrator. After flowing through the capillary it leaves the valve through the 3/16-inch line at the bottom and flows to the evaporator.

The following advantages are claimed for this valve:

1. Since the capillary is coiled around the Silica Gel drier it is kept warm by the liquid passing through the drier. This heat permits any oil carried over with the refrig-

Gilmer BELTS

Made by belt specialists . . . . . on the largest assortment of V-moulds in the world

Gilmer V-Belts fit 6800 models, 153 makes of electric refrigerators; also oil burners, stokers, air conditioners, beer pumps, water pumps, compressors and other appliances.

Gilmer jobbers carry full stocks ready for prompt deliveries anywhere.

Write for FREE copy of "America's Belt Bible"

L. H. GILMER COMPANY
TACONY, PHILADELPHIA, PA.
The Oldest Firm of Rubber Fabric Belt Specialists

erant during the running cycle to flow freely through the tubing.

2. Conversely, on the off cycle the cool gas passing through the capillary tends to cool the drier and condense any hot gas remaining in the high side of the system. This condensed gas forms a liquid seal in the bottom of the drier and prevents any hot gas from passing through the capillary until the pressures equalize.

3. The heat exchanger effect made by coiling the capillary around the warm drier eliminates the circulating oil problem and permits any refrigerant to be used regardless of whether it is miscible in oil in all proportions.

4. The condenser and evaporator pressures equalize, thereby removing a heavy starting load from the motor. This makes it possible to use a split phase motor without any unloading devices.

5. There is no chance for non-condensable gases to retard the flow of the refrigerant as in the float valve as there are no pockets in which they can collect.

6. There are no moving parts, which assures the valve of good service and long life.

7. The purge valve at the top permits it to be quickly charged or purged.

8. The filter and screens at the bottom of the drier eliminate all possibility of any foreign matter stopping up the capillary tubing.

9. The outer shell not only aids in keeping the heat inside the valve but protects the capillary from being crushed or cut.

10. No liquid receiver is needed.

11. The size of the valve, 1¾-inch diameter by 5¼-inch long, permits it to be installed in places where a float valve cannot be placed.

12. The cost of this valve is ten percent to twenty percent less than other control devices.

* * *

LITTLE GIANT PURGER

MUELLER BRASS CO., Port Huron, Michigan, announces the addition of a Purger to their line of refrigeration accessories.

This device is intended for the larger sizes of Freon 12 installations although it may be very advantageously used on all sizes of machines and all refrigerants except ammonia and carbon dioxide.

The purger provides a means of collecting

non-condensable gas, condensing the refrigerant from the non-condensables and complete purging without loss of refrigerant.

The device consists of a shell containing an evaporator coil, a sight gauge glass and necessary shut-off valves all mounted on an attractive oak panel. A relief valve is part of the unit to protect it from damage in case a user closes the valves, trapping liquid in the shell.

With the "Little Giant" Purger, purging is accomplished during the normal operation of the plant. The evaporator coil in the shell cools the contents of the shell causing a decrease in pressure. By opening a valve in the connecting line to the bottom of the receiver, liquid refrigerant will flow into and completely fill the shell.

Opening the valve in the connecting line to the top of the condenser causes a mixture of air or other non-condensable gas and refrigerant gas to be forced into the shell, displacing the liquid. The evaporator coil, acting as a condenser coil, condenses the refrigerant from the mixture and leaves only the non-condensable gas collected in the top of the shell. The amount of such gas can be determined by observing the gauge glass.

Opening the purge valve at the top of the shell then allows only the non-condensable gas to be expelled.

This device offers many improvements over ordinary purging methods. It is a positive indicator to determine whether or not non-condensable gas is present. It offers a manual means of expelling these gases without an appreciable loss of refrigerant. There are no floats or other automatic mechanical contrivances to get out of order.

The cost of excessive condensing pressures is well recognized among refrigerating engineers. It is a cost that goes on and on each hour of condensing unit operation, not only causing increased power costs but also increased consumption of condensing water and increased wear on compressor parts.

The "Little Giant" Purger offers a reliable, dependable means for effecting the lowest condensing pressure possible with a given condensing unit and existing condensing water.

Oscar Hinton
Meridian, Miss.

I enjoy THE REFRIGERATION SERVICE ENGINEER of which I receive a copy each month, but it would be better if the magazine were issued twice a month.

Just received from the printer!

THE NEW Chieftain

HERMETIC SERVICE MANUAL

YOU CAN OBTAIN YOUR COPY FROM YOUR JOBBER . . . If he cannot supply you, send 25c to cover cost of printing and mailing

TECUMSEH PRODUCTS COMPANY

Factory & Gen. Offices—Tecumseh, Michigan. District Offices: Dallas, Texas; New York; St. Louis, Mo.; Detroit, Mich.; Denver, Colo.; Chicago, Ill.; Los Angeles, Calif.; London, Ontario, Canada; Decatur, Georgia. Export Dept. Detroit, Michigan.

KELVINATOR SALES SHOW LARGE GAIN

F. R. PIERCE

THE greatest sales record in Kelvinator's long history will be hung up in 1940, it was announced by Frank R. Pierce, Kelvinator's general sales manager, who says that business during this record-smashing year has been 2¼ times of what it was in 1939.

With dealers all over the country reporting a greater public acceptance for our product than ever before, Pierce stated, this tremendous increase in Kelvinator business is highly significant.

"Both small and large retailers," Pierce continued, "have shared in the marked uptrend in business, with many dealers in metropolitan areas as well as small towns reporting triple and quadruple their 1939 volume.

Pierce reported that the 1940 program was not one of mere price cutting, as has been charged in some quarters. "It was," he said, "a broad plan to eliminate the many ills besetting the refrigeration industry and that over-pricing represented only one of these ills. Others included:

"A profusion of models, which created stocking and selling problems. This was eliminated by concentrating 96 per cent of production on six and eight cubic foot models—the size refrigerators people really need.

"No logical justification for price differences between models. This was solved by the development of a more sound 'step-up' plan.

"Too many dealers in a given market. This was remedied by a new selected dealer program, which eliminated many dealers and provided individual retailers with better markets.

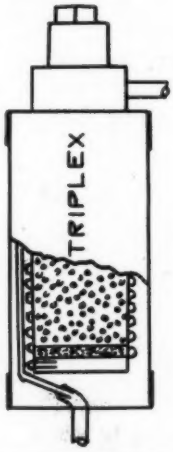
"The lack of uniform, delivered-in-the-kitchen prices that could be advertised nationally. This was answered by absorbing the freight and thus allowing dealers anywhere east of the Rocky Mountains to sell at the same price.

"Bad price-cutting practices. By using uniform prices in national ads, this was reduced to a minimum, for there was no

NOW

NEW TYPE CONTROL

FOR HOUSEHOLD APPLICATIONS



You no longer need to guess at capillary tube lengths when this new TRIPLEX valve built on the capillary tube principle solves your troubles.

This durable and inexpensive little device is a combined control valve, Silica Gel dehydrator and heat exchanger.

Here is a valve that is the ideal replacement for float valves and all other metering devices for flooded evaporators, and can be used on any household system regardless of the size or refrigerant used.

WRITE FOR FULL DESCRIPTION

AMERICAN REFRIGERATION CO.

580 MINNA ST. SAN FRANCISCO, CALIF.

longer any question of the list price of any model.

"Outmoded distribution methods. This was solved by reorganizing our distribution system. It included the elimination of some distributors, the strengthening of others and the setting up of strategic factory branches.

"Too much of what dealers termed sales-promotion 'hooey.' This was solved by the elimination of theoretical promotional campaigns."

Pierce pointed out that not only had this program produced record-breaking sales, but that it had brought about an exceptionally high average unit-sale price of its refrigerators, despite reductions of from $30 to $60 in the line.

"Although some experts predicted that the average price of refrigerators sold would take a nosedive," he said, "our dealers' reports show that 80 per cent of the sales made this year have averaged $160.23."

HUMIDIFICATION WITH THE HUMIDOME

STRANGELY enough, considering the importance of the subject, it has only been in the comparatively recent past that the public has begun to awake to the fact that humidification of the air indoors, in winter, is just as necessary—perhaps even more necessary—than "conditioning" the air in summer-time. True enough, heat is unpleasant in summer. But its rigors can be borne in the whole climate of the U. S., at least, without undue physical hardship. Humidification is a different story.

Dry Air Cause of Colds

Scientists and eminent medical authorities agree that hot, dry air in winter can be the direct cause of a multitude of "ills"—winter colds, sore throat and sinus trouble to name a few of them. Hot dry air has a terrific affinity for moisture, and in its fight to get this moisture will rob even the delicate membranes of the nose and throat, thus contributing to winter diseases materially. Equally important is the effect hot dry air has upon furnishings, paintings, rugs and drapes. It also robs them of moisture, causing eventual disintegration. Then, too, hot dry air makes it necessary to have a higher heating temperature, for the simple reason that when the body is robbed of mois-

Turn "Off Seasons" Into
PROFIT SEASONS

Many progressive servicemen are increasing their profits by selling and installing the

AIRO STOKER

Floor models furnished dealers and shop owners on "trust receipt" arrangement.

Liberal time payment plan extended to your customers. Write for complete details.

AIRO SUPPLY COMPANY
2732 N. ASHLAND AVE
CHICAGO ASCO ILLINOIS

ture it is actually being "refrigerated" and, there is a "cold feeling" even if the thermometer reads 75 or 80 degrees.

What, then, is the answer to the problem? Simply this—that in order to circumvent the troubles enumerated, some simple easy

THE HUMIDOME

method must be provided for having perfect humidification or, in simple language, the right amount of moisture evaporated into the air.

Such a humidifying device—one that has already attracted wide attention, is the Humidome, manufactured by the Harry Alter Co. of Chicago. It has many points of superiority over the ordinary humidifier which, in many instances, has been developed along "Goldberg cartoon" lines. The Humidome, to the contrary, is not only effective but simple in make-up and in operation. No "installation" is required; you just plug it into any light socket. It evaporates, if necessary, up to five gallons of water per day, thus taking care of the needs, normally, of a six-room home. The Humidome actually evaporates this water into the air; the water is not "thrown free" into the air to discolor furnishings. The reason the Humidome is so effective in this regard is due to its "miracle drum" (an exclusive development of the Harry Alter Co.) which provides a tremendous evaporation surface in a compact manner. Dealerships for the Humidome line are now being established. The Harry Alter Co. states that already such dealerships are being applied for in increasingly large numbers and that representatives appointed are having success with the Humidome almost from the day they start exhibiting it.

The Humidome is being nationally advertised by the Harry Alter Co. in such magazines as Time, Fortune, Hygeia, House and Garden, School Management and National Geographic.

"Mills" is the most important name in commercial refrigeration today.
Write Mills Novelty Company, 4100 Fullerton Avenue, Chicago, Illinois.

KELVINATOR CREATES NEW DEPARTMENT

T. A. FARRELL

ANNOUNCEMENT of the formation of a new Kelvinator factory sales unit, which will be known as the Commercial, Parts and Service Sales Division and which will be headed up by Thomas A. Farrell, is made by Frank R. Pierce, general sales manager of the Kelvinator Division of the Nash-Kelvinator Corporation.

Chief reason for the change, Pierce said in announcing the new division, is to bring the commercial, parts and service departments into one organization and thereby create a more unified and closer-knit operation.

The appointment of Farrell, who for the past twelve months has been Kelvinator's eastern sales manager, brings to the new Kelvinator post a man of widespread experience in the refrigeration industry. His background includes eleven years with Frigidaire, where he served as eastern sales manager and regional, branch and zone manager of the company.

Prior to this, Farrell was for ten years affiliated with Hyatt Bearing Division of the General Motors Corporation, working his way from a time-study engineer to the position of sales manager of the Detroit, Michigan, division of the company.

\$ \$ \$

NEW CATALOGS AND BULLETINS

THE Fall and Winter 1940-1941 Edition of the Harry Alter Catalog on refrigeration parts, supplies, tools and air conditioning equipment has been mailed. While there are relatively few changes, several important price changes have become effective with this issue. Reductions in price are particularly pronounced in the case of electrolytic condensers, and a decrease in cost is also shown in case of the Type K, L and M hard copper tubing. New low prices are also announced regarding Freon gas.

The Close-out section in the center of the catalog has been augmented with a variety of items, such as air condensers, motors,

USE

SOLIDS-LIQUIDS-GASES-SOLIDS-LIQUIDS-GASES-SOLIDS-LIQUIDS-GASES

DRIERITE

FOR DRYING AIR REFRIGERANTS INDUSTRIAL GASES

DRIERITE is an Efficient, Rapid, Economical Dryer for all the Modern Refrigerants. Dries both by Chemical Action and Adsorption.

Used in Dehydrators by leading manufacturers and furnished to the Service Engineer by leading Supply Dealers.

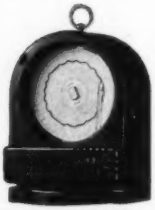
Write for literature.

W. A. HAMMOND DRIERITE COMPANY
YELLOW SPRINGS, OHIO

You should find out about THIS THERMOMETER

• You should find out how this recording thermometer helps you locate trouble, check temperatures, forestall call-back complaints. *Write today for the FREE Practical Instrument Bulletin.*

RELIABLE AND CONVENIENT: This recording thermometer gives you 24 hour records of temperature. Eight years of use in the refrigeration industry have proved its reliability. Thousands are now used for all kinds of test work. The Practical thermometer is as easy to use as an alarm clock. The pen mechanism is entirely contained in the door and swings out of the way when you open the door to change the chart. The chart is held without pins or other loose parts. These reliability features are exclusive with Practical instruments. *Write for complete information, including terms, specifications, guarantee, and 15-Day Trial Offer. All explained in the Free Practical Bulletin. Write for it today! Practical Instrument Co., Dept. G, 2717 N. Ashland, Chicago.*



Recording Thermometer $18 with metal carrying case.

USE PRACTICAL INSTRUMENTS
BUY FROM YOUR SUPPLIER

compressors, receiver tanks, flange valves, which place the serviceman in a position to take advantage of some extra desirable low prices.

This catalog, known as No. 132, contains 148 pages and represents the latest and up-to-date information on merchandise pertaining to the refrigeration field. This catalog is furnished free on request if made on letterhead or accompanied by proper identification regarding the fact that such requests come from persons engaged in the refrigeration service or equipment field.

B. F. Goodrich Co., Akron, Ohio, has issued a 168-page belt data book which is now available to the trade upon request.

This book contains 64 pages of refrigerator belt listings on all sizes and makes from the older obsolete models to the latest 1940 models. Fourteen pages of washing machine belt listings cover the entire requirements of all makes. Belts for water pumps, stokers, oil burners, gasoline pumps, wood working machines, air compressors, car washers, grease guns, paint sprays, buffing machines, floor sanders, milking machines, and slicing machines are also listed.

Conversion data contained in the last pages of the book provide an easy method of selecting the right Goodrich belt.

McCombs Refrigeration Supply Co., Denver, Colorado, introduced last month a house organ to be known as "The Refrigerator." It will be a monthly publication, catering to every one in the Rocky Mountain area.

In addition to acting as a supplement to their catalog, the publication will contain news stories of interest, service kinks, a swap column, and any suggestions that will help to promote more and better refrigeration.

* * *

Orville Root,
Indiana.

I have been receiving this magazine for two years and keep every copy. They are certainly excellent for reference on different kinds of jobs. I surely don't want to miss a copy.

Jerome Fleischer
New Jersey

Enclosed is a check of $2.00 for your very excellent magazine. We can truthfully say The Refrigeration Service Engineer is an asset to the refrigeration industry.

No Waiting • No Worrying • No Wishing . . . . . for UEI trained men!

NO WAITING—When opportunity comes UEI trained men are *prepared* for promotion.
NO WORRYING—About service problems. UEI men k n o w *all* phases of installation and service work.
NO WISHING—UEI men know you can't become an expert refrigeration serviceman by wishing. It takes *training* . . . good training . . . the type of training UEI has offered for years.
UEI training combines the finest features of home study with actual shop practice.

WRITE FOR DETAILS *NOW*

UTILITIES ENGINEERING INSTITUTE
Belden & Wayne Aves., Dept. 592, Chicago

When CESCO HEALTHGUARD FUME KIT GOES WITH YOU
On Every Service Call

★ Field and Laboratory Tested for use against AMMONIA METHYL-CHLORIDE SULPHUR-DIOXIDE and other common refrigerants ★

★ Includes Comfortable Gas-Tight MASK Interchangeable CARTRIDGES Compact, easy to carry METAL CASE ★

JUST WHAT YOU NEED—DOESN'T COST MUCH!

For health and comfort, every refrigeration service man should have this handy kit. Saves your eyes, face, throat and lungs from exposure to injurious fumes. Makes your job safer and easier.

MAIL POSTCARD FOR PRICES AND FULL DETAILS

CHICAGO EYE SHIELD CO.
2341 WARREN BLVD., CHICAGO, ILL.

ACTION-AIR
System

Make **NEW PROFITS**—*Solve Air-Circulation in Coolers & Sell on Demonstration!*

One easy demonstration sells customers on the many advantages of this Action-Air System. It's the quick answer to dead air spots, freezing zones, too much or too little moisture, and excessive frosting. It **pays for itself** by reduced shrinkage and spoilage, by less compressor operation and by electricity savings.

Make NEW profits with this fast-selling machine—proved since 1932—that **creates** customers and builds up repeat business. Get the exclusive rights in your territory. Write today for proposition.

THE BROWN CORP., 650 Bellevue Ave., SYRACUSE, N. Y.

LEAK DETECTOR

3 Tools in One

1. LEAK DETECTOR
2. SOLDERING IRON
3. BLOW TORCH

This Halide Leak Detector accurately detects Freon-12, Carrene and other *non-combustible* halide refrigerant gases.

BURNS GASOLINE, BENZINE OR NAPHTHA but not alcohol. Flame can be adjusted as desired. No pump—no pressure system. Easily converted from detector to soldering iron or torch.

10⅝" Overall
Weighs 1¾ Lbs.
Burns 30 to 45 Min.

LIST PRICE

$5.45

COMPLETE

Ask Your Jobber or Write Direct

JUSTRITE MANUFACTURING CO.
2095 Southport Ave. Chicago, Ill.

Hermetic Rebuilding

One year's guarantee on rebuilding these refrigerator units

FRIGIDAIRE • MAJESTIC • SERVEL • WESTINGHOUSE • CROSLEY • GIBSON • COLD SPOT • U. S. RADIO • GENERAL ELECTRIC

Our prices are the lowest, send for price list.

CHICAGO HERMETIC REBUILDERS
4379 ELSTON AVE.
PALisade 0881 CHICAGO PALisade 6118

DENNIS GASKETS
FOR ALL MAKES REFRIGERATOR DOORS

A complete line of rubber-coated, packed Gaskets and extruded rubber Gaskets that last longer—retain higher efficiency—because made of finest materials and workmanship. Write for free samples, giving your jobber's name and address.

W. J. DENNIS & CO.
2110-20 WEST LAKE ST. CHICAGO

Guaranteed Replacement Parts for Hermetic Units

$4.50 Each

Float Valve for General Electric and Westinghouse

35c Each

Suction and Discharge Valve Reed for Westinghouse

25c Each Lots 100

Discharge Valve Reed for General Electric

40c Each

35c Each. 25c Each Lots 100

Discharge Valve Reed for Frigidaire Meter-Miser

HASCOBILT replacement parts for Hermetic Units are Highest Quality and exact duplicates. Guaranteed in every respect to be as good if not better than the original part that came in the unit.

HASCO, INC. GREENSBORO N. CAROLINA

Write for your Free copy of our new catalog on your letterhead . . .